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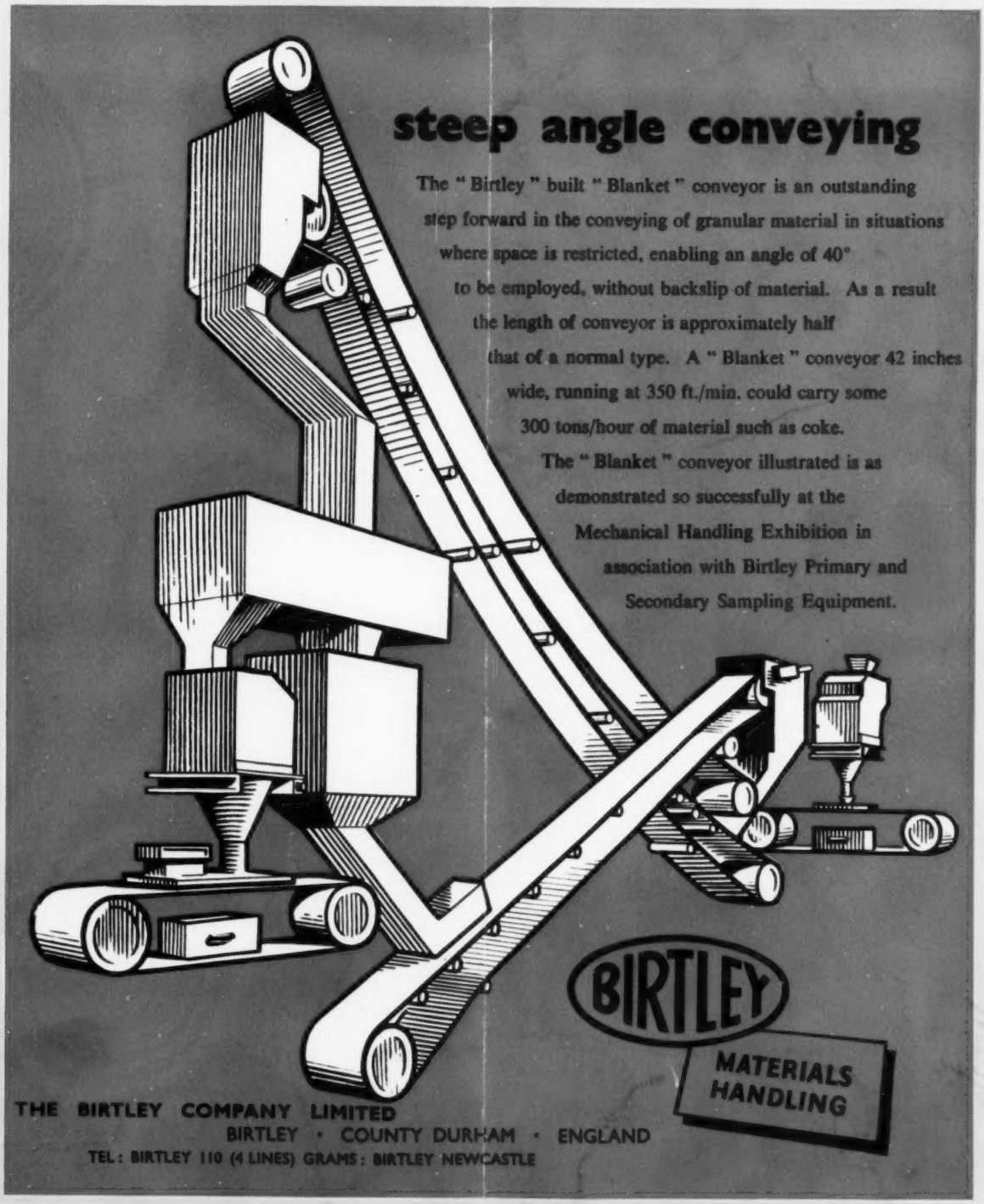
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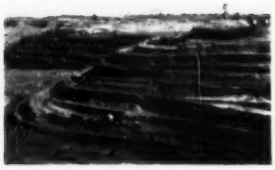

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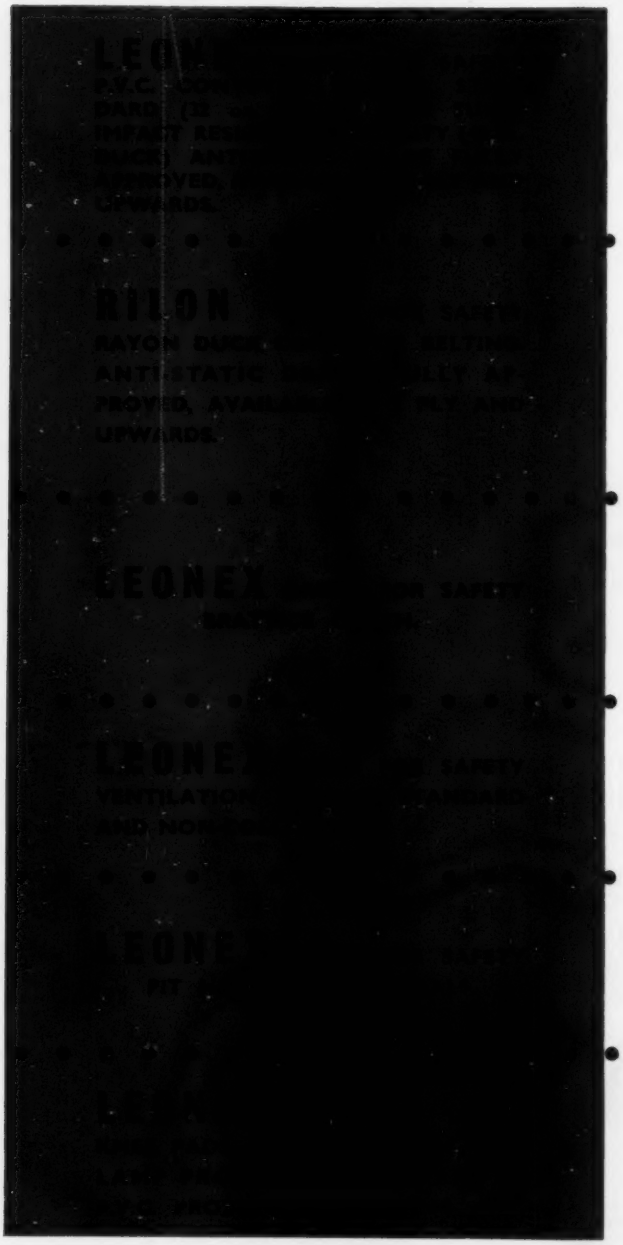

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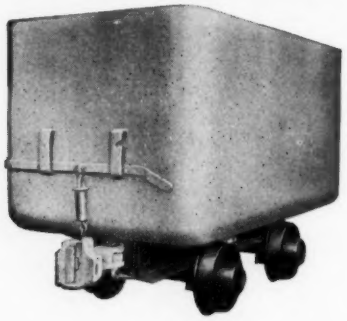

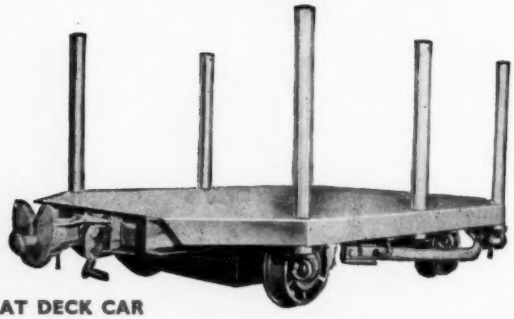

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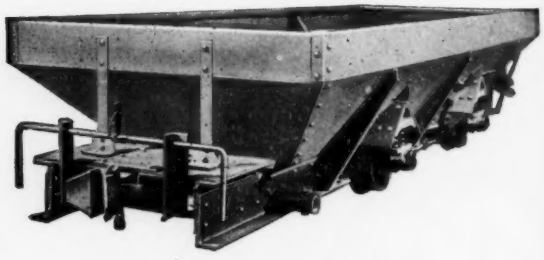

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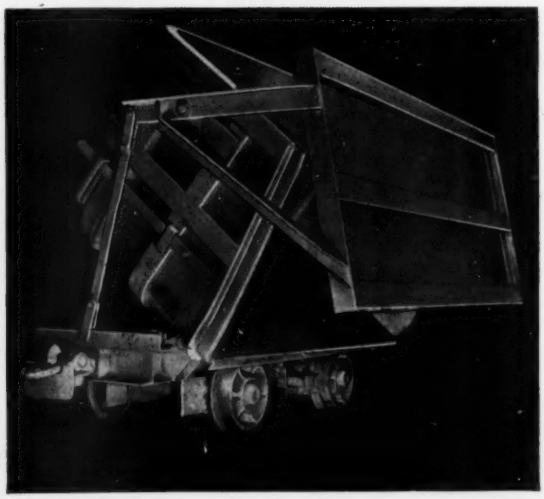

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NOTES AND COMMENTS

Oil on the Troubled Waters

If a dictator's importance can be judged by the effects of his actions, then Nasser's stature has been immeasurably increased by the seizure of Suez, for not even Hitler succeeded in antagonizing the whole of the world's maritime nations at a single stroke. Like other dictators before him, Nasser may well have forged the first link in a chain of cause and effect which will ultimately sweep him from his stucco throne. The broader implications of the Canal grab are outside the scope of a journal which is concerned primarily with minerals and metals, but it is pertinent to consider the potential impact of the changed situation on some of the major commodities within this field.

As the principal supply line for the vital commodity, oil, the Suez Canal is of critical importance to Western Europe and its free and unfettered use is a foremost requirement of economic survival. Last year Britain, by far the largest user of the canal, shipped over 20,000,000 of its total 28,000,000 tons of crude oil imports via Suez. France is the second largest beneficiary, with 12,000,000 tons of its Mid-Eastern supplies—almost half the nation's total oil imports—passing through the canal.

The U.S. imports about 4 per cent of its total oil requirements from the Middle East, and almost all this tonnage passes through the Suez Canal. Sharply stepped up European demand on Western Hemisphere oil could have the effect of boosting crude oil prices in the U.S., despite the very large resources available in the Americas. Of more direct concern to the U.S. are the effects of the seizure on tin and rubber. Of all tin used in the U.S., about 60 out of every 100 tons comes from Malaya through the Suez Canal. Tin's price in New York jumped 1¼ c. a lb. last Friday to 99¼ c., the current price. Of 1,529,000 tons of rubber used in the U.S. last year, 634,800 tons were natural rubber, most of which came from the Far East—90 per cent of it via Suez. Of the U.S. manganese imports, amounting last year to over 2,265,000 tons, more than 35 of every 100 tons came from India, almost all of it through the Suez Canal.

Britain and France are, of course, dependent on the Suez Canal not only for tin, rubber and manganese, but also for Australian lead and zinc and other essential commodities.

It is evident that restrictions on the free passage of shipping in this international waterway would affect not only raw materials in transit to Western Europe and the U.S., but also the producers of these materials in countries east of Suez. Oil companies in the Middle East, mining companies in India, Malaya, Australia and elsewhere, would be handicapped by longer time lags in the delivery of equipment and spares, due to additional days at sea, and freights might have to be raised. These difficulties would be reflected by increased production costs, which must inevitably lead to higher prices, thus contributing to inflationary trends in the consumer countries.

If Nasser intends to use the profits of the Suez Canal Co., as he claims, to finance construction of the Aswan dam, he might well have to raise canal tolls considerably. This would be the first time in the canal's history that its tolls had been increased in peacetime. Indeed, the tolls have actually been decreased 27 times—twice since the end of world war two.

Of two possible developments—higher toll charges or closing of the channel—the latter, of course, would have the most drastic impact, but either consequence would result in substantial increases in the prices of oil, tin, rubber, and other commodities. The higher prices of these basic raw materials would be reflected in all sectors of the national economies of Western Europe and, to a lesser extent, the U.S. Moreover, there is the danger that, if Nasser were allowed to "get away with it," his example may well be followed by Middle East oil Sheiks who have forgotten the lessons of Abadan.

We are confident, however, that Nasser's dreams of Middle East domination will soon be shattered and that the crisis he has precipitated may even result in a salutary realignment of political influence in this turbulent region.

Time to Take the Plunge at Volta River

The report of the Preparatory Commission set up by the U.K. and Gold Coast Governments to study the Volta River Project was reviewed in our issue of July 27, p. 109. A statement has been issued by Aluminium Limited of Canada, in which the opinion is expressed that the project

could be developed successfully, "provided it is possible to make arrangements for the financing and the division of responsibilities and risks which would be satisfactory under present conditions."

Explaining its connection with the project, the company recalled that in 1947 it acquired rights to mine extensive bauxite concessions in the Gold Coast and in 1949 secured an interest in West African Aluminium Ltd., which was already investigating the Volta River development. In 1951 Alcan and British Aluminium formed a technical mission which reported favourably on the feasibility of the project. In 1951 and 1952 the two companies joined in discussions with the governments of the U.K. and the Gold Coast, which led to a plan for joint participation in the project. Under this plan, which was described in a White Paper issued by the U.K. government in November, 1952, private enterprise would be primarily responsible for establishing aluminium production, while the governments would undertake the hydro-electric power development and the public works and transportation services involved.

Alcan points out that since 1952 several significant forces bearing on the future of the Volta River project have been at work. The past four years have witnessed a continuing inflation of construction costs and more recently interest rates have been rising. These elements have affected the attractiveness of the scheme, so that on the 1952 framework the prospective return on capital in the proposed aluminium producing company is now substantially lower than was estimated at that time.

Having regard to the heavy financial losses which have resulted in recent years from grandiose projects embarked upon without adequate consideration, the U.K. government can scarcely be criticized for its determination to ensure that the Volta River Project should not be launched without adequate consideration and pre-planning. As we stated last week, this scheme has, in all probability, been more carefully and comprehensively investigated than any other project of comparable magnitude in the world.

Nevertheless, the price of thoroughness has been heavy in terms of the capital expenditure required to bring the project to fruition, as the Preparatory Commission itself has made quite clear. The White Paper estimated that the project would cost approximately £100,000,000 at the initial stage and £144,000,000 by the final stage. The Commission's report now estimates the cost at about £160,000,000 at the initial stage and £230,000,000 at the final stage. These increases are accounted for in part by the construction of a higher dam and creation of a larger lake than originally envisaged, in part by additional costs revealed by the Commission's own exhaustive investigations, but also to increases in the prices of materials and equipment during the past four years.

Alcan has recently confirmed to the British and Gold Coast Governments its serious interest in the Volta River project. In some respects, however, the situation bears a disquieting resemblance to the story of the Sibylline books in Roman history, for which King Tarquinius was asked a higher price each time he sought to buy them. In fact, the Commission recommends that, when considering their financial commitments, the parties concerned should take into account the possibility of an increase of 40-50 per cent over the 1955 estimates.

It can scarcely be disputed that the Commission has made excellent use of the past four years. But now that the project has been exhaustively investigated from every aspect, there should be no delay in negotiating the terms of a new agreement and completing the various formalities which still supervene before the long travail is ended and a lusty and vigorous infant is at last delivered into this world of rising costs.

As Macbeth said of a less commendable undertaking, "if 't'were done, 't'were well 't'were done quickly." Otherwise, when we have at last made our minds to get started, we shall probably find that the Sibyl has raised her price once again—this time, perhaps, to a figure which no longer bears any relation to economic realities.

Metals from the Sea

According to Dr. Thomas Lee, associate professor of Chemistry at the University of Chicago, the value of dissolved metals in a cu. mile of sea water would amount to only $190,000, but the value in the 329,000 cu. miles of ocean is almost $33 trillions.

There are perhaps 50 chemical elements in sea water, of which 30 are extremely rare. The metal in the highest concentration is sodium, which is present to the extent of 12,000 p.p.m., where as the gold content of sea water is a mere six parts per trillion. In a million quarts of sea water, there will be roughly an eighth of an oz. of such metals as manganese, tin, copper, zinc and lead. There will be about one-fiftieth of an oz. of silver, antimony, nickel or cobalt, one-thousandth of an oz. of mercury, and perhaps one five-thousandth of an oz. of gold. The total value of these dissolved metals would not be much greater than 4 c. Thus the sea, though potentially the largest source of future metal supplies, offers a yield per cu. yd. which, by mining standards, is scarcely large enough to merit even the description of microscopic. So far, commercial extraction from sea water has been confined to certain light elements such as magnesium.

Though extraction of the heavier elements from sea water seems as yet far off, it is by no means inconceivable that technologists may ultimately succeed in exploiting the ocean's metallic wealth. Dr. Lee has developed a new electrical analytical technique for determining the precise amounts of trace elements in sea water. He believes that, with suitable electrical apparatus, the same technique might be used to extract such metals as manganese, copper, silver, lead, antimony and gold. The cost of the electricity required to remove the 4 c. of metals in a million quarts would be less than 1 c. The biggest obstacle is that the oxygen in the sea water would be reduced at the cathode, wasting 70 c. worth of electricity. Sea water contains about 70 parts of oxygen per million quarters. At present Dr. Lee sees no solution to this problem, but he does not exclude the possibility that in the future an electrode material might be developed that would permit the reduction of oxygen.

Other possibilities for the extraction of trace metals from sea water are suggested by the development of improved ion exchange methods. Some recently discovered resins will collect and hold metals in such minute quantities that, when processes for using them have been further developed, it might be possible to extract gold and silver from sea water, together with a number of other elements such as strontium and perhaps carbon, at an economic cost.

At present it is easier, and certainly far cheaper, to hoist a ton of ore from great depth to recover 3 dwt. of gold than to obtain a similar quantity of the metal by processing millions of gallons of sea water. As time goes on, however, further technological advances may bring down the cost of winning metals from the sea, whereas the trend of mining costs may well be upward as the richer and more accessible deposits are worked out. Nevertheless, mining has little to fear from continued attempts to exploit the metallic riches of the sea, which, at any rate initially, are likely to supplement rather than compete with what might be termed the traditional sources of supply, even should exploitation prove economically practical.

Western United States

(From Our Own Correspondent)

Portland, Oregon, July 18.

At a recent hearing before the Senate Interior Mining Sub-committee proposals for a long range mineral policy were discussed from the standpoint of both operators and government policy makers. From the trend of the discussions it would appear that the industry cannot count on any broad price support programme aimed at keeping marginal mines in business for the sake of maintaining a "healthy industry" but that help will be extended to specific minerals to keep them abreast of the world market where there is need of a long-range domestic supply and the operation shows probability that in time it can stand up under competition. This latter policy was exemplified when Administration officials expressed approval of extensions of the tungsten and asbestos purchase programmes, both of which terminate in June, 1956, and later announced that the chrome purchase programme would be extended to June 30, 1959.

TARIFFS AND STOCKPILING

Subsequent to the above-mentioned hearing, a group of Republican senators conferred with top Administration officials on matters of mineral policy. The conference was off the record and no official report is expected but from "leaks" there seems to be some ground for hope that the Administration may change its attitude in some matters important to the industry. It was urged in the conference that stockpiling is at best a stopgap, and a poor one at that. Alternatives were discussed and rejected. It seemed to be recognized that the situation calls for some action, and that without too much delay. The most surprising thing is an indication that the Administration may modify its heretofore adamant stand towards tariffs. If any change in tariff policy is made it is not expected that it will be as a straight tariff but more probably will be referred to a base price, below which the tariff would be imposed automatically and be removed when the market recovered to the base. Such a tariff has been in effect on copper for years but, as the base is 24 c., the fact has been practically forgotten.

The Office of Defense Mobilization, in a directive intended to clarify its policy in purchasing for stockpiles, stated that whenever possible purchases should be made from domestic sources in order to maintain the mobilization base of strategic materials. The directive also suspended purchase of foreign antimony and fluorspar pending an examination of domestic sources of these minerals.

According to the McGraw-Hill economic survey the mining industry plans on spending $427,000,000 in capital expansion during 1956, an increase of 34 per cent over 1955.

D.M.P.A. reports that $4,640,558 have been advanced for development in the Pacific Northwest with the result of adding ore reserves valued at $87,000,000. Repayments by way of royalties amount to $250,000 although some of the larger discoveries have not yet come into production.

The Atomic Energy Commission has announced a new purchase programme for uranium, effective April 1, 1962, when the present programme expires, and extending through the year 1966. The new programme provides a purchase price of $8 per lb. of U_3O_8 produced by domestic mills from domestic ores. A.E.C. reserves the right to limit purchase from a single property to 500 tons of U_3O_8. The initial production bonus, which has exceeded $7,000,000 during the last five years, will be continued from its present expiration date, February 28, 1957, through March 31, 1960. Comparison of the new $8 rate with the present schedule, including production bonus, shows that the two are about a standoff, with breaks, perhaps, in favour of the producers.

The general reaction by the latter is favourable although some small operators who are dependent upon custom mills fear that the new schedule will be to their disadvantage as there may be a tendency on the part of the mills to hold ore prices down to increase their profits or to boost treatment charges. One feature is that a shipper may waive payment for vanadium in his ore in which case he will not be penalized for its lime content. This will be a distinct advantage with many ores and in some cases will make the difference between a submarginal deposit and ore.

The basis of the new price programme is to encourage continued exploration and development as it is recognized that ore reserves may be seriously depleted by 1962 unless operators are assured of a favourable market after that date. As industrial demand for uranium increases it is expected that there will be a gradual transition from a market wholly government-controlled to a commercial market. A.E.C. now permits private purchase, sale and use under licence from the Commission. If reactor development continues as it has in recent years there will be a substantial market in that field.

Claims filed with the U.S. Court of Claims by gold mining companies alleging damage due to Order L208 now number 189 with a total of $121,000,000. Undoubtedly many of the claims are inflated and, to your correspondent's knowledge, at least one is ridiculous but there is no question that serious damage was done and the total loss suffered was very great.

Another example of diversification : Natomas Company, next to the largest gold dredging company in the country, has approved a stock merger with American Presidents' Lines, largest trans-Pacific shipping company on the West Coast.

COPPER PRODUCERS' FUTURE PLANS

At the annual stockholders' meeting of Anaconda Company Mr. Roy H. Glover, chairman of the board, stated that the investments in plants and properties planned for the next five years exceed those of the past ten years and investments over the 15 year period will exceed the book value of all Anaconda properties, including subsidiaries, prior to that time. It was also stated that the proposed expansion will be financed without recourse to long time borrowing. Consolidated earnings for the first quarter of 1956 were slightly under $30,000,000. Production from the newly developed Berkeley Pit will reach 10,000 tons daily by the end of 1956 with the ultimate aim of 17,500 attained by the middle of 1957. Expanded operations at Butte will add 2,500 workers in that locality.

Meanwhile Kennecott has not been standing still. In a $45,000,000 programme at its Ray, Arizona, division the mining limits at the open pit are being expanded, a new smelter is being built and a leach, precipitation, flotation plant (cost $4,700,000) is nearing completion. The latter will improve recovery of copper by £2 per ton of ore and the whole programme will increase annual production by 20,000 tons.

A General Electric official made the statement recently that diamonds are now being produced so successfully in pilot plant operation that "man-made diamonds will have an important impact on American industry and defence". As to the process it is only stated that a "carbonaceous compound" is submitted to pressures up to 2,700,000 lb. p.s.i. and to temperatures up to 5,000 deg. F. for extended periods. Progress is being made toward achieving commercial production at a price competitive with natural stones. No attempt is being made to produce gem stones. It is estimated that this can be developed into a $200,000,000 business in the next ten years.

Evaluation and Treatment of Ores and Metals

The Chemical Research Laboratory of the Department of Scientific and Industrial Research is studying a wide range of problems associated with the evaluation and treatment of metalliferous ores, the development of analytical techniques, and the recovery of valuable constituents from industrial wastes. Recent progress is surveyed in *Chemistry Research, 1955* (H.M.S.O., 4s. net.).

The work of the Chemical Research Laboratory on problems of importance to the mining industry has been reviewed in previous issues of *The Mining Journal* (8/10/54, p. 399 and 6/5/55, p. 497). The latest report makes special mention of the direct link between the Laboratory and mines engaged in the extraction and concentration of metals which are valuable for atomic energy. Nearly one-fourth of the scientific staff is engaged on work for the U.K. Atomic Energy Authority. The main researches are concerned with evaluation and treatment of minerals, ores and other materials containing valuable metals, by the improvement and development of new techniques for analysis and by study of methods of extraction and concentration of the metals present.

The results of this work are being applied in Commonwealth countries and last year a representative of the Laboratory was stationed in South Africa for a considerable period to examine processes of working conditions. This liaison has been of great value, not only by informing technologists of advances in laboratory work, but also by giving the Laboratory first-hand information about problems that might merit investigation. Recently an officer was called to Australia to advise on an important new project involving a capital expenditure of several million pounds.

RESEARCH ON COMMONWEALTH MINERALS

Much of the research effort has been concerned with the extraction and recovery of uranium and thorium from mineral deposits in various parts of the Commonwealth.

Methods which would be applicable to large-scale operation for the extraction of uranium have been studied on samples from Australia, Canada, South Africa, Rhodesia, Cornwall and Portugal, and from the phosphate industry. In addition to the study of processes involving leaching followed by selective precipitation, a considerable amount of work has been carried out on a process which entails leaching the ore with sulphuric acid and recovery of the uranium extracted by ion-exchange. Uranium can be absorbed from sulphate solution on a strong base anion-exchange resin as the complex $(UO_2SO_4)_3^{4-}$. It may subsequently be eluted with the aid of acid nitrate or chloride solutions. Various problems associated with the large-scale utilization of this process have been studied and investigations have been made into the types of resin giving the most efficient performance.

When using an ion-exchange process for the recovery of a metal from an ore, it is usual to treat the ground ore with a solution which dissolves the metal. Insoluble material is then filtered off and the metal is recovered from the filtrate by passing the solution through an ion-exchange resin. An alternative procedure, which avoids the need for filtration, consists of adding ion-exchange resin of suitable bead size directly to the pulp of ore and extracting solution. The ion-exchanger containing the adsorbed metal is then removed from the pulp by screening or by a suitable mechanical device and passed to an eluting circuit. Several pieces of apparatus based on this principle and designed to operate in a continuous counter-current manner have been constructed and are under investigation.

A study is also being made of the use of solutions of certain organic phosphates in kerosene for the extraction of uranium from solutions. It has been shown possible, with the aid of this type of complexing agent, to extract uranium from sulphate or phosphate solutions.

The reports for the years 1951-54 dealt with previous work on the use of the strong base ion-exchange resins for the recovery of gold from cyanide solutions, which finally resulted in small pilot trials at a Rhodesian gold mine. These initial trials were successful and further work is being carried out in a much enlarged pilot plant. Last year, however, a new process was evolved which promises to bring about a major change in gold recovery (*The Mining Journal*, 21/8/55, p. 467). The essence of the new discovery is that gold and silver can be selectively adsorbed from a normal gold mill pregnant liquor by certain weak base ion-exchange resins and can then be easily eluted by an aqueous solution of a relatively inexpensive reagent such as ammonium thiocyanate. Carefully controlled conditions in the laboratory have produced experimental batches of material with greatly increased selectivities for gold. Considerable research remains to be done before the feasibility of the proposed process can be proved. Nevertheless, the preliminary results have aroused great interest among gold producers.

A 3-month contract was accepted to study the extraction of niobium from the Mrima deposit in Kenya. Promising results were obtained by direct chlorination in the presence of carbon at about 500 deg., when most of the niobium, together with much of the iron, titanium and vanadium, distilled off in the form of chlorides or oxychlorides. Treatment of the distillate with water and subsequent boiling resulted in the hydrolysis and precipitation of the niobium together with the titanium. Under the best conditions an overall extraction of 80 per cent of niobium was possible in the form of a product containing about 40 p.c. Nb_2O_5.

OTHER DEVELOPMENTS

For the separation of the rare earths a large-scale apparatus has been constructed that will handle kilogram quantities of mixed earths using ion-exchange methods. Considerable interest has been expressed by the Atomic Energy Authority, which asked for quantities of specific pure rare earth compounds. Preparation of pure rare earth metals, a project being carried out for the Pure Metals Committee, has, so far, been confined to cerium and lanthanum.

In the Laboratory's report for 1954 reference was made to the discovery of selenium in useful concentrations in sludges collecting in certain parts of the plant for purifying sulphur dioxide produced by the burning of pyrites in flash roasters. Research work is now centred on the examination of methods of extracting the selenium from these sludges. It is understood that a firm is setting up recovery plant and this source could provide a substantial contribution to Britain's limited supplies of selenium. The recovery of germanium from zinc concentrates and from ammoniacal liquor is also being studied.

With the co-operation of the National Industrial Salvage and Recovery Council a number of trade wastes are being examined in the hope that some of them might serve as sources of the less common elements. At the request of the D.S.I.R. Intelligence Division this survey is being extended to include slags and fumes produced during the smelting and refining of non-ferrous metals.

Mining Prospecting in Tanganyika

During recent months Tanganyika has suddenly become a focus of prospecting operations. A number of mining companies are engaged in a big way, and large sums of money are being spent on exploration. It is probable that the discovery and preliminary investigation of the Mbeya pyrochlore deposits by the Geological Department and their taking up by the Billiton Company, have stimulated this interest. A large pilot mill is now being erected by that company.

The result of this upsurge of activity is that the Territory is being divided up into what can be called "zones of interest," as shown on the map. The four areas marked 1 belong to New Consolidated Gold Fields; that marked 2 to the Anglo American Prospecting Company (Africa) Ltd.; 3 and 4 to Williamson Diamonds Ltd.; 5 to the B.P. Shell Petroleum Development Company (Tanganyika) Ltd. (the new name of the D'Arcy Shell Exploration Company Ltd.); and that marked 6 to Mr. H. Vogt, an individual whose aerial prospecting has already met with some success. The total area thus being actively prospected exceeds 135,000 sq. miles or more than a third the area of the Territory.

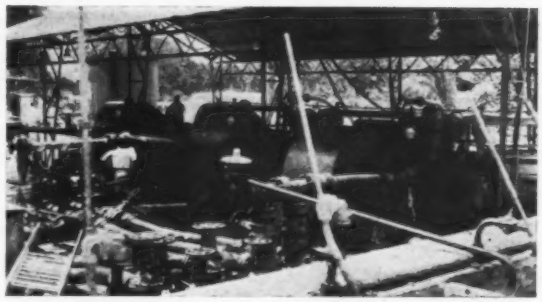
With the exception of the oil licence all these zones of interest have been taken up during the current year, and are additional to the smaller mining leases and exclusive prospecting licences already held.

INFLUENCE OF AERIAL PROSPECTING

The advent of aerial prospecting on a grand scale has necessitated closing much larger areas of country to general prospecting than was formally considered advisable; but if a company is prepared to spend considerable sums on aerial photography and geophysical prospecting, they must be given protection against the machinations of the speculative pegger. The procedure now adopted is to close an area to prospecting for a short period, usually three months with the possibility of extension to six months. During this period the company interested has time to fly the area, and to select any parts over which they would like a title. Exclusive Prospecting Licences are then granted over those smaller areas.

KEY TO SHADED AREAS

1. 38,500 square miles. Temporary closure granted over four areas to New Consolidated Gold Fields Limited. **2. 34,000 square miles.** Special Exclusive Prospecting Licence applied for by Anglo-American Prospecting Company (Africa) Limited. **3. 33,750 square miles.** Temporary closure granted to Williamson Diamonds Limited. **4. 50 square miles.** Special Exclusive Prospecting Licence applied for by Williamson Diamonds Limited. **5. 20,000 square miles.** Oil Exploration Licences granted to B.P. Shell Petroleum Development Company (Tanganyika) Limited. **6. 10,000 square miles.** Temporary closure granted to Mr. H. Vogt.



The three mud pumps operating during drilling activity at Mafia Island

Ten years ago it would have been difficult to do this, owing to the number of individual prospectors in the field whose rights would have had to be cared for, but latterly high costs, the low price of gold, and other reasons have reduced the number of such prospectors very considerably. Large areas known to be mineralized have, in fact, of recent years been completely devoid of individual prospectors.

With the completion of the aerial reconnaissances, a very different state of affairs is coming into being, while the many anomalies found are investigated on the ground. The B.P. Shell Company are already maintaining some 80 men in the field, Gold Fields are proposing to have four prospecting parties out, while Williamson and the Anglo American Corporation have already a considerable force of prospectors on the job.

Most of the anomalies found are, of course, in out of the way regions—many are in areas where at one time of the year water is short and at other times far too plentiful, and many others lie in thick bush.

PROSPECTING DEVELOPMENTS

The B.P. Shell company have completed their deep well on Mafia Island, and are now sinking another on the Island of Zanzibar. More deep wells are projected and a second rig is to be brought in to drill at least two more wells on the mainland.

Gold Fields are already examining a discovery made by the Geological Department south of the Uluguru mountains, and two others in the Mbeya district made by Mr. Vogt in the little aircraft which he pilots himself. A considerable number of other radioactive anomalies found by the company on its own flights are awaiting their turn for ground investigation.

The Anglo American Corporation are also examining a carbonatite deposit at Ngualla in the Chunya district; and are preparing to attack the inaccessible, fly-infested bush which covers much of the enormous tract of country, over which they have applied for exclusive rights.

It is inconceivable that so much activity should not result in discoveries of importance, and so the next few years in Tanganyika should be extremely interesting ones to the mining fraternity.

NEWBATTLE RECONSTRUCTION—I.

The Newbattle Surface Reconstruction Scheme

During the summer meeting of the Institution of Mining Engineers at Edinburgh, visits were arranged to a number of Scottish collieries at which programmes of reconstruction and development were completed or well advanced. Among the most interesting of these projects is the Newbattle surface reconstruction scheme, which involved re-organization of Easthouses Colliery and of surface transport to a central preparation plant. The scheme is described in the following article. The first instalment, appearing herewith, describes the scheme generally before discussing installations at Easthouses Colliery.

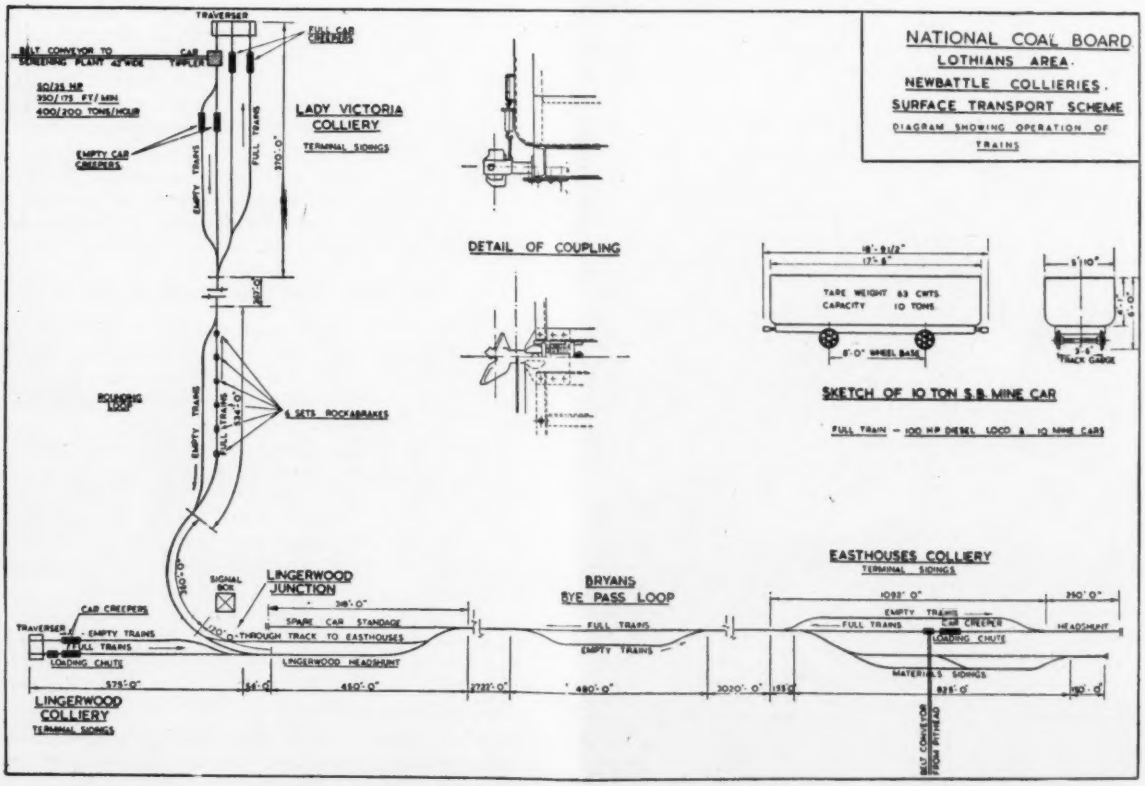
The Newbattle group of collieries, adjacent to Newtongrange, Midlothian, consists of three collieries situated on the eastern outcrop of the Limestone Coal group of seams in the main Lothian coalfield. The Lady Victoria Colliery, together with the central preparation plant for the group and the central workshops, is situated at Newtongrange, with Lingerwood Pit about half a mile to the south-east and Easthouses Mine some two miles to the north-east. Formerly the output of Easthouses and Lingerwood collieries was transported in tubs by an endless under-rope haulage system to the Newbattle central screening and washing plant situated alongside the Lady Victoria pit.

Hoisting at Lingerwood Colliery is by a shaft equipped with two double-deck cages carrying one 18-cwt. tub per deck, the equipment being capable of handling a maximum of 1,500 tons of run-of-mine coal per day, winding on two shifts. At Easthouses Colliery coal was hoisted by heavy endless rope haulage on a steep incline and the maximum hoisting capacity for two shifts was limited to 1,200 tons of run-of-mine coal.

At Easthouses Colliery the Great Seam is worked and its thickness varies between 5 ft. 6in. and 7 ft. 6in. The suitability of this seam for the introduction of face mechanization justified the improvement of the underground transport and hoisting system in order to increase the hoisting capacity, reduce the manpower employed in handling the coal, and provide a more reliable system of hoisting. It was therefore decided to equip one of the existing inclines to hoist 1,000 tons per shift, using a balanced direct rope haulage with trains of two 9-ton capacity drop bottom monitor cars. By retaining the existing endless rope incline haulage in operation, the maximum hoisting capacity at this colliery has been increased to some 2,500 tons a day.

Loading station at Easthouses Colliery

No change was made in the winding equipment at Lingerwood, but it was decided to install pneumatic tub handling plant with double-decked traversers and tub tipplers to enable the tubs to be handled mechanically and



Operation of trains in the Newbattle transport scheme

tipped close to the shaft. The run-of-mine coal is conveyed from the pithead building to a suitable loading station, where the 10-ton cars are loaded for transport to the Lady Victoria tippler station.

The new diesel loco haulage system provides adequate transport with a saving of over 60 manshifts per day over the old endless rope haulage system.

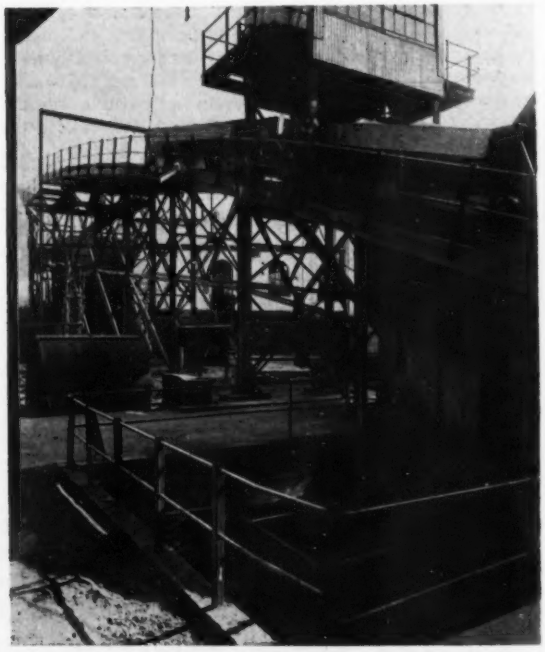
EASTHOUSES COLLIERY

No. 1 Incline was the main endless rope haulage road, by which all output was hauled to the surface. The length is 4,500 ft. and the average gradient 1 in 2.3. It is equipped with a large steam-driven endless over-rope haulage with 1¼ in. dia. rope to which the 18-cwt. tubs are attached singly by lashing chains. Due to the steep gradient any derailment is liable to cause a serious wreck. This incline has been retained to operate on one shift only per day to handle output from one district and all redd produced from backbrushing and development.

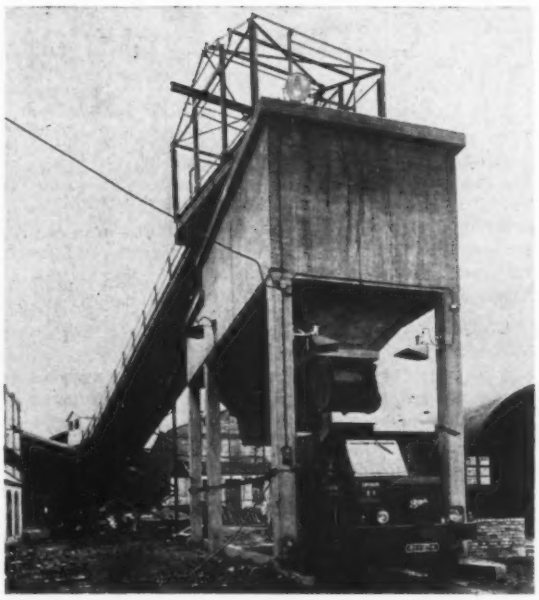
Simpson's Incline was driven about 25 years ago parallel to No. 1 Incline but to an even gradient. In 1946/49 it was equipped with a steam-driven direct rope haulage engine to hoist trains of eight man-riding carriages, each train carrying 64 men. The mouth of this incline, which is the main return airway, is enclosed by an airlock with connection to the pithead baths. A connection to the yard enables materials to be sent underground by this route.

No. 2 Incline, which is also parallel to No. 1 Incline, was orginally the main return airway and man-riding incline, but was made available for reconstruction in 1949 when Simpson's Incline was equipped. No. 2 Incline was arched with 12 ft. x 10 ft. girders but was not absolutely straight; as it had been driven to follow the seam, the gradient was not regular. At the foot of the incline a new part was driven at a gradient of 1 in 2, dipping under the old mine bottom landing where the seam commenced to flatten out, to form the new monitor car loading station.

The track for the monitor car haulage system is 4,200 ft. long. The rail gauge is 4 ft. 6in. On the upper half of the incline three-rail track is laid. Normal double track is used at the byepass and, on the lower half of the incline, interlaced double track is used in order to obtain maximum clearance. Each train is, therefore, on its own independent track and mistakes in shifting of points cannot occur. The tracklaying was executed by the Clydeside Constructional Co. Ltd., who designed a special train to handle the long rails and sleepers.



Surface gantry at Easthouses showing drop bottom mine cars



Redd disposal unit at Easthouses Colliery

The monitor cars were specially designed by the Distington Engineering Co. Ltd. and are of the drop bottom type. A loaded train of two cars weighs 29 tons and runs at a maximum speed of 12 m.p.h. on the incline.

THE LOADING STATION

The loading station is arranged to enable the total of eight compartments in the train of two cars to be loaded simultaneously immediately the train lands on the buffer stop. Four measuring hoppers, corresponding to the four compartments in each car, are mounted in tandem immediately over the cars and are fitted with compressed air operated roller mounted sliding bottom doors. The four doors in each set of measuring hoppers are mechanically linked, the pneumatic control being so arranged that both sets of doors can be operated either simultaneously or independently. Each set of four hopper doors is operated by four Westinghouse 6 in. dia. x 36 in. stroke double acting cylinders. The hoppers are loaded by means of a special bottom-chain scraper conveyor, which scrapes the coal downhill on the 1 in 2 gradient over the open top of each hopper, filling each of the eight hoppers successively from the top down. The conveyor is 60 ft. long and is driven at a chain speed of 80 ft./min. by a 20 h.p. motor through a Holroyd worm reduction gear and Renolds Duplex chain drive. The scraper conveyor is fed by a troughed belt conveyor, running at 200 ft./min., which is in turn fed by one of two reciprocating feeders from a 120-ton capacity main hopper in the pit bottom. The equipment is designed to fill the eight measuring hoppers in approximately four minutes and discharge them into the monitor cars in 30 secs. The tub tippler equipment is capable of emptying tubs at a maximum rate of 200 tons per hour.

Current Developments in the World Steel Industry

After a deadlock which has lasted for thirteen weeks, and has involved a loss of crude steel production which falls not far short of 500,000 tons, a Court of Inquiry has begun investigations which it is hoped will result in a peaceful settlement of the disputes with the craft unions employed in the iron and steel works and the termination of the embargo on overtime working by the repair gangs.

Unfortunately the procedure of a Court of Inquiry, the deliberations which precede the publication of its findings and the response of the disputants, constitute a cumbersome process and time is on the wing. At best several weeks may elapse before normal working is resumed and much essential repair work usually done during the holidays is held up. Meanwhile the restrictive effects on production are progressive, and the consequences of declining outputs are mitigated only by the fact that consumers stocks had been previously raised to an exceptionally high level and provide a useful cushion against temporary shortages.

Vastly greater in scale, and more serious in its industrial repercussions was the U.S. steel strike which was settled only last week. The U.S. plants usually produce more steel than the whole of Europe, and the nation under stoppage has involved a daily loss of 250,000 tons of steel production. The strike army numbers 650,000 and in Chicago alone, over 50,000 rail workers have been laid idle in consequence of the stoppage. It is estimated that the overall rate of industrial production has fallen 4 per cent, and the President has now taken preliminary steps in the direction of active intervention to bring the stoppage to a speedy conclusion.

AN OPTIMISTIC OUTLOOK

Assessments of the outlook for steel are still optimistic. Some contradiction in the demand for consumer goods has been noted, and the shrinkage in the motor industry both in this country and in the U.S. is notorious. But the world requirements for steel for constructional works and capital developments continue to expand. Demand for structional steel is greater than ever and plans for the expansion of capacity have not been halted.

Untroubled by labour disputes, European producers are enjoying a period of unparalleled prosperity. German steel production last month was the highest ever. Throughout the six countries affiliated to the European Coal and Steel Pool production continues to rise and an aggregate output of 27,926,000 tons in the first half of this year was 2,143,000 tons above the corresponding figures in 1955.

Even this expansion, amounting to about 7 per cent, has not enabled European producers to keep pace with the demand and Herr Sohl the head of the Thyssen steel plants has been moved to express his concern over the disparity between the costs and prices of British and German steel.

British steel is still the cheaper, and Herr Sohl's explanations are two-fold. German steel scrap, he says, costs the consumer £17 10s. per ton whereas the price in Britain is £11 5s. Secondly the excess price for coal imported from the United States is borne in Britain by the whole community whereas in Germany the steel industry has to fend for itself.

The conclusion is that British steel is well able to confront foreign competition, but profit margins are not what they were. Since the last price increases for British steel were authorized in May, the industry has been saddled with steep increases in the cost of production. Wages and rail transport charges have advanced and coal and fuel oil prices are higher. One of Britain's biggest steel producing companies has already given warning that earnings must be " adversely affected ".

On the other hand earlier anxieties concerning the adequacy of supplies of raw materials have been dispelled. There has been a tremendous acceleration of imports of iron ore since the first quarter of the year. The shortage of cargo space has been overcome : increased supplies have been obtained mainly from Sweden and from Canada and at the end of June imported ore stocks totalled 1,461,000 tons compared with 1,035,000 tons at the same date last year. In the same period stocks of scrap have risen from 561,000 tons to 750,000 tons and pig iron stocks from 579,000 tons to 847,000 tons.

Although Sweden's supremacy in the world markets for iron ore is now threatened by Labrador and to some extent by Venezuela, this country is still by far the biggest exporter. Germany has been and still is the biggest consumer of Swedish ores, total receipts last year amounting to 6,400,000 tons. But British blast furnaces are also consuming very much larger tonnages, last year's imports exceding 4,000,000 tons. Rising costs of fuel and of transport enhance the value of high grade ores such as Sweden can offer. Compared with ores rich in ferrous content over twice the weight of Britain's lean ores have to be smelted to produce an equivalent tonnage of pig iron. Moreover lean ores require more fuel to smelt them and in these days of shortage, especially of coking coals, this a serious consideration which further tilts the balance in favour of Swedish supplies. Thus the current year's exports of iron ore from Sweden are expected to reach or nearly approach 17,000,000 tonnes which represents an increase of 1,300,000 tons on the figures for last year. Stockpiling and loading facilities at the ice-free port of Narvik alone have been increased to 12,000,000-13,000,000 tons a year, and orders have been placed for more ore carriers with a capacity exceeding 200,000 tons d.w. None of these will be less than 14,000 tons d.w., two will have a capacity of 21,000 tons, one of 27,000 tons and two of 32,500 tons.

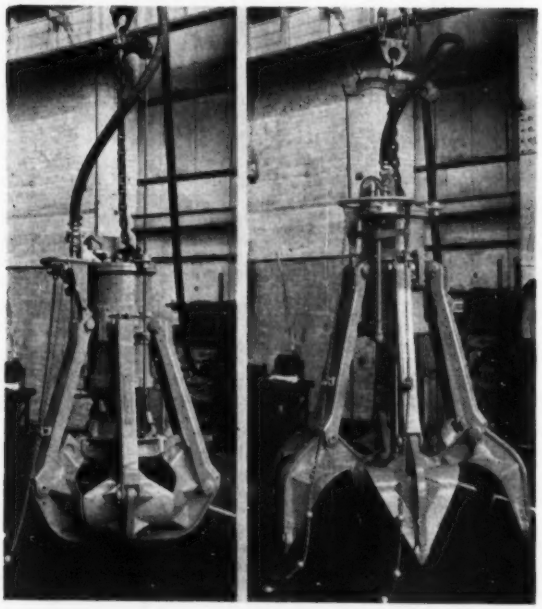
DEVELOPMENT IN INDIA

Impelled by great and growing deficiences in supplies the Indian Steel Commission is moving rapidly ahead with its development plans. Mr. M. Shab, the Minister of Heavy Industries, estimates the steel deficit for the current year to be not less than a million tons. Contracts have already been placed for the import of more than half this tonnage from Russia, Poland, Czechoslovakia, Japan and West Germany and a delegation is now in Dusseldorf finalizing the details of the plan for the construction of a new steel plant at Rourkela for the supply of equipment at a total estimated cost of between £46,000,000 and £50,000,000. German interests have also secured contracts for the extension of the Tata steel works at Jamshedpur which will raise the annual capacity of 1,200,000 to 2,000,000 tons the increase being at an estimated cost of £45,000,000, whilst an official delegation is shortly expected to arrive in London to complete the details of a contract for the construction of a steel plant at Durgapur by a British consortium. The foreign exchange cost of this million ton plant is expected to be about £50,000,000.

MACHINERY AND EQUIPMENT

The New Air-Cactus Grab

The big problem when sinking deep coal or metalliferous mine shafts has, in the majority of cases, been the clearing of the blasted material. The speed at which a shaft can be sunk is naturally almost invariably based on the speed with which this material can be removed. Inevitably, new methods of clearing this material have been debated for many years and



The Priestman Air-Cactus Grab. At left closed, at right open

eventually an idea was brought forward by the engineer of a South African gold mining company, the basic principle being to use a grab of the Cactus variety.

On test, however, it was found that the operation of the standard pulley purchase unit was not fast enough and speed was, of course essential. Eventually the mining company and the South African distributors of Priestman Brothers, Ltd., developed the operation of the grab by means of compressed air and the first Air-Cactus grab was born. The unit incorporated a double acting air cylinder and the operation of the unit was controlled by one man. It is interesting to note that after the teething troubles had been overcome, this grab was operating in a shaft of approximately 26 ft. 6 in. rough dia. in which the world shaft sinking record was broken in 1953 and a depth of more than 560 ft. was reached in one month.

The grab itself is suspended from a special hoisting mechanism lowered down the shaft and merely picks the material from the shaft floor and deposits it into buckets which are lifted to the surface. This type of grab has been recognized in South Africa as the most efficient and economical method of shaft mucking possible.

The unit is suspended on two ropes anchored to the centre girder of the grab carrying the blades, so ensuring that when opening, the grab blades do not lower into the buckets. The valve is mounted on the head of the grab together with a silencer and the operation of the valve is carried out by a man standing alongside, holding twin operating chains.

The Air-Cactus range includes units of 12, 20 and 30 cu. ft. capacity, varying from 8 ft. 2 in. to 10 ft. 9 in. height open and 7 ft. 1 in. to 9 ft. 2 in. closed. Diameters (open) range from 6 ft. 3 in. to 8 ft. 7 in. and 4 ft. 11 in. to 6 ft. 11 in. when closed. Maximum working heights are 10 ft. 4 in., 11 ft. 8 in. and 13 ft. 10 in. respectively, while relative weights are 3,800, 5,950 and 8,950 lbs. One model has six blades; the larger two have eight.

The complete range of Priestman grabs includes one, two, three or four line working, Grapples, Cactus, Orange Peel, Whole Tine, and air-operated shaft mucking grabs.

A Range of Grinding Machinery

While wet grinding ball mills, rod mills and tube mills are sufficiently similar in construction and operation to enable them to be treated together, their fields of usefulness are reasonably distinct. This point is early emphasized in an interesting brochure published by Head, Wrightson and Co. Ltd. wherein the facets of difference and resemblance of the manufacturers' ball, rod and tube mills are described, as are the application of these equipments in ore dressing practice and the factors controlling their operation.

The mill is driven by machine-cut spur gearing from a turned shaft, the mill shaft being driven by a texrope drive or an enclosed spur reduction gear from the motor. Direct drives are recommended for mills requiring more than 250 h.p. Reduction gear drives may be substituted for mills up to 800 h.p. in which slip ring motors from 1,440 to 288 r.p.m. and enclosed spur reduction gears with flexible couplings are used.

Conveyor Belt for Ore-Unloading Wharf

One of the giant conveyor belts recently manufactured by the Goodyear Tyre and Rubber Co. Ltd., is that produced to assist the British iron and steel industry. Produced at Wolverhampton, this belt weighs 21,798 lbs., and recently left the company's factory.

The belt forms part of an order for equipping the conveyor installation now being erected by Messrs. Colvilles Ltd., at the General Terminus, an ore unloading wharf on the South banks of the Clyde. This installation will serve the existing Clyde Iron Works and the new Ravenscraig plant.

The belt is 48 in. wide Goodyear Stacker, 1,465 ft. long, built with seven plies of 32 oz. duck and has a $\frac{3}{16}$ in. top cover and $\frac{1}{16}$ in. bottom cover. It is illustrated being positioned for crating and despatch at the works of Goodyear Tyre and Rubber Co. (Gt. Britain) Ltd.

The Goodyear Stacker belt for ore transportation at Colvilles Ltd.

MINING MISCELLANY

Exports of manganese ore from the Amapa deposits in Brazil may begin before the end of 1956, states the Director of the Cia Industria e Commercio de Minerios. The line for the transport of ore to the shipping point has been completed, but since the ore loading installations are not yet ready for operation, initial shipments will be small.

* * *

Newmont Mining Corporation and Natomas Co. have joined with Goldfield Consolidated Mines Co. in a joint exploration venture in Ethiopia. Goldfield holds a prospecting licence with a long-term lease attached, granted by the Ethiopian Government in July, 1955, which covers three areas comprising approximately 30,000 sq. miles. Prospecting will be undertaken shortly on the Mormora River, where the possibility of developing a gold placer deposit suitable for dredging will be investigated.

* * *

Mogul Mining Corporation is underwriting $7,000,000 of 5 per cent Sinking Fund Debentures of Irish Copper Mines. The proceeds are for the construction of a concentrator of 4,000 tons daily capacity, which has already been started in the Vale of Avoca about 40 miles south of Dublin. Established ore reserves are reported to total 21,350,000 tons averaging 1.13 per cent copper, 0.23 per cent lead, 0.63 per cent zinc and 8.38 per cent sulphur. The sale of debentures will provide adequate working capital to start production by midsummer, 1957.

* * *

A preview of a sound colour film, "Mining for Nickel," was given by the Mond Nickel Company at Grosvenor House, London. This film, which was publicly presented for the first time in the U.K., was made for the parent company, International Nickel, by Film Graphics of New York under the technical guidance of INCO's manager of mines, Mr. Herbert J. Mutz. Of 45 minutes' duration, it took two years to make and gives an impressive indication of the magnitude of the operations and the immensity of the effort made by the company to maintain and expand nickel production. The film includes unique shots of explosions, one of which moves 500,000 tons of ore, and of the unusual shaft sinking operations.

Three engineers at Tatabanya in Western Hungary designed a new machine for salvaging usable coal from old slag heaps. The machine produces 70-80 wagons of good quality coal a day from these slag heaps. The excavating equipment of the machine is shown at work

The Buhemba Mine is a gold producer operating in the Musoma district of Tanganyika. The property produces some 20,000 oz. of gold a year. The illustration shows the crushing plant and fine ore bin

For these shots, including underground blasting, the cameras had to be protected and, in some cases, expendable cameras were used. At times temperature conditions were such that hot-plates were necessary to keep the cameras from freezing.

PERSONAL

Mr. E. S. Mosley has been appointed Industrial Relations Director of the East Midlands Division of the National Coal Board in succession to Mr. H. Hicken.

* * *

Mr. B. R. Cant, general works manager of the National Gas and Oil Engine Co. Ltd., has been appointed works director. Mr. J. Smith, chief engineer, has become technical director.

* * *

Metropolitan-Vickers Electrical Co. Ltd. is revising its "Register of Ex-Apprentices and Ex-Trainees." The last edition, containing 10,000 short biographies, was published in 1950. Forms asking for present particulars have been sent to all those whose addresses are known to the company. Any ex-apprentice or ex-trainee who has not received a form (or has not yet replied to one) is invited to write to Mr. R. F. Marshall, Manager, Education Department, Metropolitan - Vickers Electrical Co. Ltd., Trafford Park, Manchester 17.

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On and after Saturday, August 11, the registered office and London departments of Powell Duffryn Ltd. will be located at the new group headquarters at 8 Great Tower Street, London, E.C.3. Telephone: Mansion House 4555.

CONTRACTS AND TENDERS

The International Co-operation Administration (I.C.A.) has announced the following procurement for Formosa: Rock drill steel; rock drill machines accessories and spares; drill rods and bits; drill bit maintenance materials and supplies. Project Implementation Order No. 84-23-054-9-60319, Invation No. U.S. 103 B. Issuing authority, Central Trust of China, Purchasing Department, 68 Yen Ping Nan Road, Taipei, Taiwan (Formosa). Closing date August 24, 1956. B.O.T. Ref.: E.S.B.18968/56/ICA. Telephone enquiries to Chancery 4411, extension 360.

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Pegsons Ltd., of Colville, have concluded negotiations for supplying a complete crushing and screening plant worth about £200,000 for the construction of a new dam at Kayna, 250 miles south of Bombay.

* * *

A 12,000 kW. turbine-generator set has been ordered from Metropolitan-Vickers by the Perak River Hydro-Electric Power Co., Malaya, for whom a similar machine is already being constructed at the Trafford Park Works. Both sets are to be installed in one of the company's thermal stations at Malim Nawar.

* * *

The Federal Power Board has been asked by Impresit South Africa (Pty.) Ltd., contractors for the main civil engineering work on the Kariba hydro-electric project, for permission to sublet certain work. The Cementation Company has been invited to undertake drilling and grouting on the dam foundations and the power house. The value of this contract would be calculated on the amount of work found necessary and would probably be about £700,000. Richard Costain (Rhodesia) Ltd. has been invited to build a main approach road at a cost of about £150,000.

METALS, MINERALS AND ALLOYS

COPPER.—The seizure of the Suez Canal, the settlement of the steel strike, and the disturbed labour conditions on the Rhodesian Copperbelt have failed to evoke any effective buying interest in the United States copper market. This indifferent attitude is partly a function of the holiday period. But, too, it forcibly tells the story that brass mills, wire mills and foundries have more copper in their larders than at any time in the last nine years, and also that orders for new refined copper in June at 88,854 tons represented the smallest offtake in any one month since February, 1954. July orders indicate a total of about 89,000 tons while August bookings so far of 36,000 tons provide little cheer.

At this rate the weight of supplies must soon grind down the price to lower levels. However, with Chilean copper commanding 40 c. a lb. in the States there can be no real disposition on the part of the producers to lower prices and hopes are being stretched to hold the present price structure until the automobile industry begins its new model production, which may provide the spark to touch off a resumption of demand. Meanwhile, producers are still quoting 40 c. and custom smelters 38 c. a lb.

The copper market's index of sensitivity to world events has shown up in the scrap price and this has moved up ½ c. to form the split price of 32/32½ c. a lb., the bulk of activity being carried out at the upper limit.

Indirect support for the maintenance of the present U.S. price structure comes from the £25 a ton increase in the fixed price of the Rhodesian Selection Trust group which became effective on Wednesday. *Prima facie*, this price does no more than bring the R.S.T. quotation more in line with other world prices but it may, too, be anticipating further trouble on the Copperbelt.

On Tuesday, 2,500 ticket paid workers at the new Bancroft mine went on a three-day strike to air their attitude to the breakdown of the discussions between the Chamber of Mines and the African Mineworkers' Union on the question of what, and how many, job categories qualify the African for membership in the rival Union, the African Staff Association. That Bancroft was the mine selected for the token strike is nice perception by the Union in that the resultant stoppage is relatively unimportant, as Bancroft has not yet joined the list of copper producers. But that there was a stoppage at all and that the response was so decisive, clearly suggests that " African Advancement," can only proceed with the utmost care and caution.

LEAD.—Lead has been a good market in New York at 16 c. a lb. So much so that feeling is turning into belief that this price level is permanent. This situation gains credence on the news that August shipments are being bought at the spot price.

Demand is continuing to improve from cable producers and from battery manufacturers. During the first five months of 1956 lead consumption in the U.S. amounted to 495,091 tons compared with 469,066 tons in the corresponding 1955 period. Of this total the battery industry absorbed 149,007 tons against 138,689 tons, cable makers used 57,375 tons compared with 49,666 tons, while tetraethyl compounds took 79,681 tons as opposed to 66,931 tons.

TIN.—Plagued by news both good and bad, tin has been a somewhat volatile market on both sides of the Atlantic. Earlier in the week New York was apprehensive about how high the price might go under the influence of the expected re-entry into the market of the tin platers on the settlement of the U.S. steel strike which coincided with the news that the Malayan tin miners would stop work on August 7. The situation was further complicated by the Suez Canal grab and reports of a threatened strike of Nigerian tin workers on August 13. However, with dealers asking about 2 c. above the market price and buyers still cautious, the New York market took its cue from London. In the event, Malayan miners called off their strike temporarily to allow for third party intervention and with a better feeling generated about the Suez situation, the market calmed down with the price on August 1 being quoted at 99.25 c. a lb.

ZINC.—The U.S. zinc market continues featureless, although buyers are expected to re-enter the market in some strength once the steel mills are operating at full capacity. The price is holding firm at 13½ c. a lb. East St. Louis for Prime Western grades. According to the U.S. Bureau of Mines consumption of slab zinc during the month of May declined 6 per cent to 81,000 tons, the lowest monthly consumption rate since July, 1955.

ALUMINIUM.—The United Steelworkers' Union has called out on strike 28,000 workers of Alcoa and Reynolds, who between them account for two-thirds of the total U.S. production. A second union, the Aluminium Workers' International Union, which represents 16,500 other employees of the two companies, has temporarily delayed strike action in the hope of reaching a settlement. In general, the unions are demanding the same wage increases for their members as those gained for steel industry workers last year after a 30-day strike. The steel industry's new three-year contract provides wage increases of 45 to 55 c. (3s. 3d. to 4s.) an hour. It was expected that the settlement in the aluminium industry, when it came, would follow similar lines. At present wages in the aluminium industry average about $2.22 an hour. It has been stated that only four of Alcoa's 12 plants now on strike are smelters and of the nine Reynolds plants on strike only four are smelters. A spokesman for Alcoa said recently that, until an agreement was reached, his company at least was unlikely to make any change in prices, although a price boost would probably develop after a wage settlement.

Reductions in the prices of aluminium remelted ingots came into effect in the U.K. on August 1 and are expected to give a useful stimulus to the foundry trade. They follow lower prices for scrap announced at the beginning of July and of re-casting alloys a fortnight ago. Ranging from ¼d. to 1½d. per lb., they are sufficient in some cases to make aluminium castings more competitive with iron castings. In the first five months of this year output from the foundries fell by about 1,000 tons a month to around 6,600 tons. The price reductions should contribute to an improved turnover of aluminium.

A spokesman for Alcoa stated recently that, until an agreement was reached, his company at least would make no change in prices, although a price boost would probably develop after a wage settlement.

Canadian aluminium exports continue to show a slow improvement, largely as a result of adequate power facilities and an increasing production rate from the new facilities installed since the beginning of this year. Shipments during the first six months totalled 221,613 tons—more than 50,000 tons less than the figure of 271,957 tons reported for the corresponding period of 1955. Reflecting the tightness of the primary supply for domestic fabricators and the increased dependence on remelt aluminium, exports of scrap during January-June, 1956, were more than 50 per cent lower than in the first half of 1955—3,197 tons against 6,903 tons.

Because of the continued tight supply arising from a remarkable increase in domestic requirements, Japanese aluminium refineries are planning to cut export shipments of primary aluminium during the financial year 1956-57 to below 3,000 tons. The target was formerly estimated at 6,000 tons.

A shipment of mining machinery and railway equipment, loaded at Baltimore and representing an unusual heavy-lift cargo, will shortly be installed on the island of Jamaica for use in connection with bauxite mining operations of the Kaiser Bauxite Company. The cargo includes 35 all-welded aluminium gondola railway trucks—the first to be built in the U.S. Through the use of lightweight aluminium and improved design, they will have an increased payload of 14 tons per car over the conventional steel gondola cars now in use. Each weighs 19 tons and will carry 84 tons of bauxite compared to 70 tons per steel car.

MOLYBDENUM.—Latest candidate for the title of " wonder metal " is molybdenum, according to Dr. J. Herbert Hollomon, manager of metallurgy and ceramics research at the G.E. Research Laboratory in the U.S. Its tremendous strength at red hot temperatures makes it one of the best materials for the jet engines of to-morrow. Its only defect is that it " goes up in smoke when it gets red hot in the vicinity of air or oxygen of any form ". This weakness has been known for many years, but General Electric metallurgists believe that the problem can be solved by putting a coating on molybdenum to protect it from oxygen. Molybdenum with a suitable coating may provide aircraft designers with a key to the door of the so-called heat barrier through which they already seek to pass.

NICKEL.—The U.S. government has announced that to encourage expansion of nickel production it will pay premium contracts, covering production costs. At present, the Government gives fast tax amortisation and market price purchase contracts to encourage nickel production expansion. The new step would give either domestic or foreign producers further financial help.

The U.S. Government's nickel plant in Nicaro, Cuba, operated by the Nickel Processing Corporation, produced a record 15,730 s.tons of nickel in the 12 months ended June 30. This compares with 14,752 tons in the previous year. When the expansion programme is completed, capacity will be raised to 24,500 tons.

International Nickel is reported to be optimistic about the possible development of the $140,000,000 mining project at Mystery Lake in Manitoba, referred to in our last week's issue. This project was said to be the most promising of any now under investigation by the company. To be economical, however, the mine must be a producer of nickel second only to INCO's property at Sudbury, Ontario, which produces 65 per cent of the world nickel supply. The company is hopeful that by the end of September there will be enough workable tonnage to support the mine.

A bill providing for development of the nickel deposits in Surigao by private capital is being reconsidered in the Philippine Senate, after running into heavy opposition in that chamber following its passage by the house. The acting chairman of the Senate Committee on Agriculture and Natural Resources has indicated that he will attempt to prepare a compromise measure which will meet the objections of some Senators that the original bill is a "give-away" of valuable government resources and, in addition, grants legislative powers to the Secretary of Agriculture and Natural Resources.

GOLD.—On Tuesday, July 31, gold rose by a further 2½d. to the record price of 252s. 1d. on the further decline in sterling. The previous peak of 251s. 11d. was established in February, 1955. Too much importance should not be attached to the upward trend in the gold price, since this is the season when sterling always comes under pressure. This year the effect of seasonal factors has, of course, been accentuated by various unfavourable developments such as the seizure of the Suez Canal; the strike in the British motor industry; and the Chancellor's request to bankers that they should continue the credit squeeze, which has been unfavourably received by continental operators.

URANIUM.—President Eisenhower has opposed the establishment of a stockpile of atomic materials, as proposed by Senator Anderson, chairman of the Joint Committee on Atomic Energy. He said that such a programme would require a significant increase in the production of uranium ore, which would not only call for large Government appropriations, but would also deplete available technical manpower. It would take several years, he stated, to increase production of the materials, which are "too valuable to be placed in an atomic Fort Knox." The U.S. is now the non-Communist world's leading producer of raw nuclear fuel uranium and uranium concentrates, states the Atomic Energy Commission in its semi-annual report. U.S. uranium ore production has reached nearly 3,000,000 tons a year and is expected to rise further to 5,000,000 or 6,000,000 tons a year, compared with the 1948 production of 70,000 tons.

The London Metal Market

(From Our Metal Exchange Correspondent)

Recent events in the Middle East have had a disturbing effect on markets generally with price movements being particularly marked in copper and tin, and whilst the present state of uncertainty persists the further outlook of the market must remain dependent on the day to day developments in the situation.

In copper the firmness at the end of last week received added impetus on Monday on account of the political situation, the settlement of the U.S. steel strike, and reports of a strike and labour unrest in Rhodesia. Three months' metal was dealt in up to £315 per ton, but although this level was not maintained an advance of £20 from Friday's close was recorded. Since then forward copper has been quoted at just below £300 per ton, but with renewed buying interest in the middle of the week the market advanced to the £306 mark. Conversations have taken place between representatives of the London Metal Exchange and the Board of Trade regarding the disposal of the 36,000 tons of copper by the British government and a further announcement is awaited. On Wednesday it was announced that the R.S.T. price would be increased to £300 per ton c.i.f. U.K., electrolytic wirebar basis, with immediate effect.

The tin market has also been subjected to strike news from Malaya and Nigeria, which in conjunction with the other factors previously mentioned, has resulted in a firm market. It is still uncertain whether in fact a stoppage will occur in the East but latest reports indicate a strong vote in favour although at the same time pointing out that mediation by a third party would be entertained. The forward quotation closed firm at the end of last week at £762 per ton and advanced to £780 per ton on Tuesday, but here again this level could not be maintained and on the following day three months' changed hands at £773 per ton. On Thursday morning the Eastern price was equivalent to £772½ per ton c.i.f. Europe.

There are no special developments in the lead and zinc markets which have also been firm as a result of the trouble in the Suez Canal area. Demand for high-grade zinc is, of course, affected by the strikes and holidays in the motor trade, whilst the demand from galvanizers for g.o.b. is affected to a certain extent by the overtime ban on the part of maintenance men in the steel industry. There has been fair activity in lead in the U.S. where buying by battery-makers has predominated, whilst zinc demand is expected to improve as a result of the settlement of the steel strike there.

Closing prices and turnovers are given in the following table:—

	July 26		August 2	
	Buyers	*Sellers*	*Buyers*	*Sellers*
Copper				
Cash	£290½	£291	£314½	£315
Three months	£289	£289½	£313½	£314
Settlement	£291		£315	
Week's turnover	6,150 tons		7,050 tons	
Tin				
Cash	£755	£756	£765	£767
Three months	£753	£754	£760	£762
Settlement	£756		£767	
Week's turnover	495 tons		1,570 tons	
Lead				
Current half month	£112½	£113	£116½	£117
Three months	£111½	£112	£115	£115½
Week's turnover	2,100 tons		5,675 tons	
Zinc				
Current half month	£93½	£93½	£96	£96½
Three months	£92½	£92½	£94½	£95
Week's turnover	1,575 tons		2,825 tons	

OTHER LONDON PRICES—AUGUST 2

METALS

Aluminium, 99.5%, £190 10s. per ton
Antimony—
English (99%) delivered, 10 cwt. and over £210 per ton
Crude (70%) £200 per ton
Ore (60%) bases 23s. 6d./24s. 6d. nom. per unit, c.i.f.
Bismuth (min. 1 ton lots) 16s. lb. nom.
Cadmium 12s. 0d. lb.
Chromium, 6s. 11d. lb.
Cobalt, 21s. lb.
Gold, 251s. 11½d.
Iridium, £29/31 oz.
Manganese Metal (96%-98%) £259/£265 according to quantity
Magnesium, 2s. 4d. lb.
Nickel, 99.5% (home trade) £519 per ton
Osmium, £24/27 oz. nom.
Osmiridium, nom.
Palladium, £8 0s./£8 10s. oz.
Platinum U.K. and Empire Refined £34/£35 oz. Imported £37 10s./£38 10s. nom.
Rhodium, £42.
Ruthenium, £15/£17 oz.
Quicksilver, £84 10s. ex-warehouse
Selenium, 112s. nom. per lb.
Silver, 78½d. f.oz. spot and 78½ f'd.
Tellurium, 15s./16s. lb.

ORES, ALLOYS, ETC.

Bismuth	50% 7s. 3d. c.i.f. 40% 6s. 3d. lb. c.i.f.
Chrome Ore—	
Rhodesian Metallurgical (semi-friable) 48%	£16 15s. 0d. per ton c.i.f.
„ Hard Lumpy (45%)	£16 15s. 0d.
„ Refractory 40%	£10 15s. 0d. per ton c.i.f.
„ Smalls 42%	£13 15s. 0d. per ton c.i.f.
Baluchistan	£17 5s. 0d. c.i.f.
Magnesite, ground calcined	£28 0s./£30 0s. d/d
Magnesite, Raw (ground)	£21 0s./£22 0s. d/d
Molybdenite (85% basis)	8s. 2½d. nom. per lb. (f.o.b.)
Wolfram and Scheelite (65%)	247s. 6d./252s. 6d. c.i.f.
Tungsten Metal Powder (98% Min. W.)	20s. 2d. nom. per lb. (home)
Ferro-tungsten (80%-85%)	17s. 2d. nom. per lb. (home)
Carbide, 4-cwt. lots	£41 3s. 9d. d/d per ton
Ferro-manganese, home	£66 per ton
Manganese Ore Indian Europe (46%-48%) basis 125s. freight	105d./106d. per unit c.i.f.
Manganese Ore (43%-45%)	98d./99d. per unit c.i.f.
Manganese Ore (38%/40%)	92d. per unit
Brass Wire	3s. 1½d. per lb. basis
Brass Tubes, solid drawn	2s. 5½d. per lb. basis

The Case for West Driefontein

The No. 2 shaft at West Driefontein G.M. Co. Ltd., showing the hills of the Pretoria Series on the skyline

Investors who follow closely the fortunes of West Driefontein and were expecting an improvement in mill grade when the company introduced its new mechanical sorting methods have not been disappointed as the recent advance in recovery in grade from 15.2 dwt. per ton during the year 1954-55 to as high a level as 18.3 dwt. per ton during June quarter of 1956, testifies. But, the fact that the company's recovery at the mill now exceeds the value of its ore reserves by 1.5 dwt. per ton raises the question as to whether this higher yield can be maintained.

VALUE OF MECHANICAL SORTING

Under the new sorting process, West Drie will be able to exclude about 30 per cent of waste rock hoisted before it reaches the mill. And owing to the narrowness and friability of the main gold carrier—the Carbon Leader Reef—the practical application of this task presents no great problem. During the year 1954-55 when the new process was not fully operative, out of 856,978 tons of ore hoisted, a total of only 143,778 tons—or 16.8 per cent—were sorted, leaving 713,000 tons to be milled. But since then the system has been more fully introduced which explains the sharp advance in grade.

From the investor's point of view, the difficulty which now arises is how to relate current development values shown in inch dwts. to future mill grade. Under normal conditions this calculation is quite straightforward and merely involves the deduction of a margin representing mine call factor etc.—normally put at about 20 per cent—and division of the remaining inch-dwt. figure by the mine's average stoping width. But under the new conditions, it would appear easier to adjust upwards the grade which would normally have been indicated by the above calculations, by making an allowance for the 30 per cent of tonnage excluded by sorting. However, so long as development values continue at their present average level of 860 inch dwts.—or 60 inch dwt. higher than in 1954-55—all would appear to be well for the time being.

What does this new technical development mean in terms of profitability? Naturally, the expansion of mining and development work inevitably entailed will—as the chairman of the company warned shareholders—have the effect of boosting costs per ton milled. Yet, after taking this into consideration, together with the additional taxation attracted by so sharp a gain in gold output, there is no doubt that the operation will be an extremely profitable one.

Whether or not the present high mill grade can be held in the longer term must, of course, be a matter of individual opinion. But the fact that recovery has been allowed to reach the present level by responsible management should help to a large extent to allay serious fears of an imminent drop. On the other hand, it is most likely that West Drie will eventually draw a substantial proportion of its total tonnage from the lower grade Main Reef. Even this event could be partially offset by development from the new No. 5 shaft towards the southern part of the company's western section which gives promise of being one of the property's richest areas.

Nevertheless, if one is prepared to take a long-term view of future development prospects, and assume that the overall rate of recovery will eventually settle down at around 15 dwt. per ton, a good case could be made out to show that West Drie 10s. shares have an attractive future. If this view is to be accepted, it is also necessary to look forward to an annual milling rate of 1,800,000 tons of ore per year which, after all, is coming to be regarded as the accepted maximum for the O.F.S., and is only some 300,000 tons more than the company itself has suggested in the past. With a recovery of 15 dwt. revenue under these conditions (taking gold at 250s. a fine oz.) would amount to 187s. per ton of ore milled. From this figure, say 70s., would have to be deducted in respect of costs (so large an increase in productivity together with economies which should be possible as opening up progresses, should substantially reduce the present level of 81s. per ton). This would leave a total of 117s. before tax of about 70s.—or 60 per cent—giving, in all, a net profit of 47s. per ton of ore milled. Even if uranium earnings—which could be greatly enhanced under the new sorting operation—are left aside, annual net profit after taxation of about £4,250,000 could be earned. As West Drie's issued ordinary capital of £3,520,540 in 10s. shares does not appear likely to be increased, it would, therefore, seem possible for dividends of 120 per cent ultimately to be paid.

WEST DRIE WORTH £7 10s. A SHARE

Taking a yield basis of 8 per cent, the shares could thus be valued at 150s. Meanwhile, West Drie shares return about 5 per cent at their present price of 104s.

Any assessment of West Drie would be incomplete without some reference to the company's possible future participation in the composite mineral area lying south of its own and the Blyvooruitzicht properties. In terms of the agreement drawn up regarding this area, West Drie would be entitled to a 25 per cent participation in the cash vendor consideration which would be applied in subscribing for shares at par in any company formed to mine this area. In addition a 30 per cent subscription right at par could be taken in the new company's initial working capital. It should be remembered, however, that 25 per cent of West Drie's vendor consideration would become due to West Witwatersrand Areas.

Attractive though such long term forecasts might appear, it is necessary to bear in mind that current development at West Drie is only in its very early stages. Indeed, opening up operations have mainly been confined to a relatively small area in the north-western section between Nos. 1 and 2 shafts. An underground exploration programme is, however, being pushed ahead with all rapidity. This involves sinking three new shafts; No. 3 has already been completed, while work is proceeding on two more, Nos. 4 and 5 shafts. So far, development towards No. 3 shaft has revealed values at least equal to the average for the mine as a whole, as has development towards No. 5 shaft. No. 4 shaft—having only reached a depth of under 2,000 ft.—does not yet enter into the picture.

COMPANY NEWS AND VIEWS

Kansanshi to Double Initial Production Rate

A progress report issued by Rhodesia-Katanga in respect of operations at Kansanshi Copper Mining Company during the six months ended June 30, 1956, has disclosed that arrangements are in hand whereby the mine's initial production rate is to be doubled to some 700 l.tons of copper monthly.

The report states that Kansanshi should be able to mine a minimum of 50,000 s.tons of 12 per cent oxide ore in addition to the 12,000 tons of sulphide ore previously envisaged. This news is most welcome as there had been considerable doubt as to whether an economic process could be found for treating the company's oxide deposits. Reflecting these enhanced prospects for the future, the shares of Rhodesia-Katanga (which holds some 35¼ per cent of Kansanshi) have moved up sharply during the past few days to about 35s. which compares with the low point of 24s. 9d. this year.

Provided that values in oxide ore deposits at the property prove to be consistent with earlier findings, it is anticipated that mining can commence in about three to four months' time. Output would then build up over a period of a further two to three months to 3,000 s.tons of high grade oxide per month.

Output of sulphide copper ore is also due to commence before long. The initial rate of milling will be 12,000 tons of ore monthly, estimated to contain 3.5 per cent copper. Thus, by December this year it looks as if Kansanshi should be well on the way to producing some 700 l.tons of copper monthly or at the rate of 8,400 l.tons a year.

Taking the price of copper at its present level of around £300 per ton, and costs, at say, £120 (no royalty is payable by Kansanshi in contrast with Copperbelt companies), this could mean a profit of about £180 per ton of metal produced. On this basis, total revenue earned by the company would run into the region of £1,500,000 a year. Initially, of course, no taxation would be payable by Kansanshi and this large sum would be fully available to be set against capital expenditure incurred, so far in developing the mine, amounting to some £1,500,000, and towards repayment of an outstanding loan totalling £200,000.

Naturally, development and exploration must continue apace for some time to come in order to prove or disprove the existence of large sulphide deposits at depth. In these circumstances it is impossible to estimate what level of production might be envisaged by the end of 1957 or, indeed, what funds might by that time have been earmarked for further capital expenditure. Nevertheless, although some little time must pass before the future can be seen more clearly, the company has certainly got off to a flying start and would appear to be able to anticipate a position of considerable financial strength.

In connection with the Kansanshi oxide ore deposits it is interesting to compare the present figure of 50,000 s.tons, estimated by the consulting engineers as being immediately available for mining, with a statement of ore reserves previously issued by Rhodesia-Katanga. This gave proved high grade oxide copper reserves—averaging about 9.5 per cent—at over 500,000 s.tons. The present figure would thus appear to be extremely conservative.

Another point of particular interest contained in the report concerned the company's sulphide orebody which is, of course, by far the most important deposit in the longer term future. By the end of June, a total of 260 ft. of development in No. 10 vein (previously called 'H" Vein) had been accomplished of which 190 ft., including three complete exposures, had been sampled giving an average assay value of 5.39 per cent copper over 232 in. The importance of this intersection lies in the proof it provides that ore exists below the top dolomitic bed. Definite conclusions as to the continuation of the vein in this area must, however, depend on further development.

LONDON STOCK EXCHANGE PRICES — JULY 26 - AUGUST 1, 1956

Finance	Price Aug. 1	+ or — on week
African & European	3 1/16	-1/16
Anglo American Corpn.	7 1/16	-1/16
Anglo-French	22/-	.....
Anglo-Transvaal Consol.	1 1/8	.....
Central Mining (£1 shrs.)	51/6	—3d.
Consolidated G'fields	57/9	—9d.
Consol. Mines Selection	1 1/16	-1/16
East Rand Consols	2/-	.....
General Mining	3 1/16	-1/16
H.E. Prop.	9/6	.....
Johnnies	41/3	+3d.
Rand Mines	3 1/16	.....
Rand Selection	1 1/8	-1/8
Union Corporation	38/6	—1/4½
Vereeniging Estates	4 1/16	-1/16
Writs	1 1/16	-1/16
West Wits.	36/6	—2/-
Rand Gold		
Blyvoors	21/6	—3d.
Brakpan	5/9	.....
Buffelsfontein	27/6	+7½d
City Deep	10/6	+3d
Consol. Main Reef	1/16	-1/16
Crown	1 1/8	-1/8
Daggas	2 1/16	-1/16
Dominion Reefs	18/6	+3d
Doornfontein	21/3	—6d
Durban Deep	1 1/8	.....
E. Champs	2/9	.....
E. Daggas	9/3	+3d
E. Geduld (4s. units)	28/6	—6d
E. Rand Props.	46/4½	—1/1½
Geduld	3 1/8	-1/16
Govt. Areas	3/9	+3d
Grootvlei	18/4½	—6d
Hartebeestfontein	38/6	—9d
Libanon	7/-	—1½
Luipards Vlei	13/-	—3d
Marievale	19/9	—4½
New Kleinfontein	3/10½	+3d
New Pioneer	14/6	—7½
Randfontein	40/-	+6d
Robinson Deep	8/6	+3d.
Rose Deep	8/6	.....
Simmer & Jack	3/6	.....
S.A. Lands	1 1/16	-1/16
Springs	2/7½	+1½d
Stilfontein	24/9	—3d
Sub Nigel	1 1/16	-1/16
Vaal Reefs	32/-	.....
Van Dyk	2/3	—4½d
Vesterspost	12/9	—3d
Vlakfontein	16/10½	—6d
Vogelstruisbult	16/10½	—1/1½
West Driefontein	4 2/16	-1/16
Rand Gold contd.		
W. Rand Consolidated	1 2/16	-1/16
Western Reefs	28/6	—1/-
O.F.S. Gold		
Freddies	8/3	.....
Freddies Consolidated	4/-	.....
F.S. Geduld	4 1/8	-1/16
Geoffries	8/-	—3d
Harmony	25/3	+3d
Loraine	6/3	—6d
Lydenburg Estates	17/-	—1/-
Merrispruit	8/-	—3d
Middle Wits	12/3	—1½d
Ofsits	59/9	—2/10½
President Brand	57/6	—1/3
President Steyn	31/6	—6d
St. Helena	29/6	.....
Virginia Ord.	9/9	—3d
Welkom	20/6	—6d
Western Holdings	3 1/8	-1/8
West African Gold		
Amalgamated Banket	1/4½	.....
Ariston	4/-	.....
Ashanti	16/-	—3d
Bibiani	2/3	—1½d
Bremang	1/4½	—4d
G.C. Main Reef	1/6	+1½d
Konongo	1/7½	+4d
Marlu	1½d	.....
Taquah	1/7½	+4d
Western Selection	7/-	—3d
Australian Gold		
Gold Mines of Kalgoorlie	13/6	+4½d
Great Boulder Prop.	11/-XR	.....
Lake View & Star	16/7½	+3d
Mount Morgan	21/3	+9d
North Kalgurli	7/3	.....
Sons of Gwalia	2/10½	.....
Western Mining	9/10½	.....
Miscellaneous Gold		
Cam & Motor	7/10½	—1½d
Champion Reef	6/6	.....
Falcon Mines	7/9	—3d
Globe & Phoenix	25/9	.....
Motapa	10½d	.....
Mysore	3/7½	.....
Nundydroog	10/-	+3d
St. John d'El Rey	34/-	+1/6
Zams	2 1/16	+1/16
Diamonds and Platinum		
Anglo American Inv.	8 11/16	+1/16
Casts	22/4½	—3d
Cons. Diam. of S.W.A.	10/6	.....
De Beers Defd. Regd.	5 3/8	-1/16
De Beers Pfd. Regd.	13½	-1/8
Pots Platinum	12/10½	.....
Waterval	21/6	—6d
Copper		
Bancroft	51/3	+7½d
Chartered	71/6	+3d
Esperanza	3/-	—1½d
Messina	9 1/16	+1/16
Nchanga	13½	+1/8
Rhod. Anglo-American	5 1/8	+1/8
Rhod. Katanga	34/4½	+2/10½
Rhodesian Selection	48/3	+9d
Rhokana	41	+1/2
Rio Tinto	3½	+1/4
Roan Antelope	26/4½	+7½d
Selection Trust	4 1/16	+1/16
Tanks	7 1/16	+1/16
Tharsis Sulphur Br.	4¼	-1/4
Tin (Eastern)		
Ayer Hitam	23/9	.....
Gopeng	9/9	.....
Hongkong	5/4½	.....
Ipoh	23/6	.....
Kamunting	8/-	+1½d
Kepong Dredging	3/1½	.....
Kinta Tin Mines	15/3	.....
Malayan Dredging	9/6	—3d
Pahang	11/-	—4½d
Pengkalen	13/1½	—4½d
Petaling	7/-	—9d
Rambutan	25/-	.....
Siamese Tin	9/-	+3d
Southern Kinta	14/4½	.....
S. Malayan	7/-	—4½d
S. Tronoh	5/9	.....
Sungei Kinta	14/-	.....
Tekka Taiping	5/9	.....
Tronoh	8/9	—3d
Tin (Nigerian and Miscellaneous)		
Amalgamated Tin	10/3	.....
Beralt Tin	48/6	+2/9
Bisichi	4/1½	.....
British Tin Inv.	22/-	+9d
Ex-Lands Nigeria	2/-	.....
Geevor Tin	17/6	+2/-
Tin (Nigerian and Miscellaneous) contd.		
Gold & Base Metal	1/1½	.....
Jantar Nigeria	4/4½	—1½d
Jos Tin Area	12/3	.....
Kaduna Prospectors	1/6	.....
Kaduna Syndicate	2/4½	.....
London Tin	9/4½	.....
United Tin	10½d	.....
Silver, Lead, Zinc		
Broken Hill South	61/-	+1/6
Burma Mines	4/4½	—3d
Consol. Zinc	51/3	+2/6
Lake George	14/-	+3d
Mount Isa	20/10½	+1/-
New Broken Hill	44/9	+5/-
North Broken Hill	4 3/8	+1/16
Rhodesian Broken Hill	11/7½	+7½d
San Francisco Mines	25/-	+1/3
Uruwira	5/3	—3d
Miscellaneous		
Base Metals and Coal		
Amal. Collieries of S.A.	46/-	+6d
Associated Manganese	34/9	—1/-
Cape Asbestos	9/10½	+1½d
C.P. Manganese	27/-	—1/-
Consol. Murchison	2 1/16	+1/16
Natal Navigation	59/-	—1/-
Turner & Newall	105/-	—2/6
Wankie	17/6	.....
Witbank Colliery	5¼	+1/4
Canadian Mines		
Dome	$27	.....
Hollinger	$55	+1/4
Hudson Bay Mining	$186	+10
International Nickel	$200½	+12
Mining Corpn. of Canada	£9½	+1/4
Noranda	$117	+3
Quemont	£10½	.....
Yukon	5/-	+4½d
Oil		
Apex	38/-	—3d
Attock	37/6	—6d
British Petroleum	163/9	—12/-
Burmah	98/9	—14/4½
Canadian Eagle	64/-	+3d
Mexican Eagle	21/9	.....
Shell	7 3/8	-1/8
Trinidad Oil	77/9	+1/10½
T.P.D.	47/6	+1/3
Ultramar	41/10½	+7d

Markets Show Strong Resistance to Suez Seizure

After the initial shock of Egypt's Suez Canal seizure, which knocked *The Dow Jones Industrial Index* down to 512.30, a brisk rally developed on Wall Street which had, by August 1, raised the level to 518.69—a new 1956 high.

Affecting the U.K. so much more seriously than any other country, the Suez news constituted a major disturbing influence on the London Stock Exchange. Violent fluctuations developed in oils and substantial switching to Canadian issues was reported from this section. Sterling became very weak. Under these conditions Wall Street improvements were largely ignored and undue weight given to reports of an invasion of Northern Burma by Chinese troops. But nevertheless, markets stood up well to the barrage of bad news and *The Financial Times Industrial Ordinary Index* lost only 1.7 points to 183.9 by August 1.

In view of the extremely bearish atmosphere surrounding oils, it was perhaps a little disappointing that Kaffirs were not able to behave better. Yet a steady undertone was evident and *The Gold Share Index* gave up no more than 2.2 points to 80.4.

The Rand and O.F.S. monthly returns were regarded as being extremely satisfactory while the sharp rise in the price of gold to an all-time record of 252s. per oz. before easing to 251s. 11½d. was a most encouraging feature particularly for the large low-graders. In the O.F.S. section, Free State Geduld after falling to 90s. 7d. rallied to 92s. 6d. Other shares notable for their performance included St. Helena which advanced 3d. to 29s. 6d. and P. Steyn which put on 6d. to 31s. 9d.

On the strength of the metal price and New York advices, coppers improved, particularly Rho-Kats and Bancroft.

Johnnies Pays 17½ Per Cent

A dividend of 17½ per cent on its issued ordinary capital of £5,266,666 on £1 shares has been declared by Johannesburg Investment Company in respect of the year ended June 30, 1956. It will be recalled that distribution during the previous year was cut to 15 per cent from the 17½ per cent level which had been held for many years. Subject to audit, gross profits for the year totalled £2,292,643 compared with £1,928,261 in 1954-55. After taxation of £104,762 (£46,425) a sum of £1,474,769 (£3,470,314) was transferred to investment reserve. Dividend absorbed £529,958 (£454,250) and the balance carried forward increased to £298,840 from £115,686. It will be recalled that during 1954-55 a credit of £1,800,000 was received in respect of U.K. taxation for previous years. This arose from a revaluation of investments for taxation purposes.

Book value of quoted investments, other than those in subsidiary companies, was £10,643,202 at June 30 (£9,410,516). Market value of these holdings, based on stock exchange or directors' valuation, was £18,298,041 (£18,594,431).

Winklehaak : Kimberley Reef Values

Winklehaak Mines, situated in Bethal District of the Far Eastern Rand, has announced the completion of No. 3A ventilation winze to its planned depth. The Kimberley Reef was intersected in the station crosscut 858 ft. below surface where values averaging 4.3 dwt. per ton over 16 in. were obtained from 10 sections. Development on reef will, however, be delayed until station cutting has been completed.

It was also disclosed that No. 1A ventilation winze—which had been delayed by water bearing fissures associated with faulting—has now been completed. A station has been cut at 890 ft. below surface. But as a result of faulting the reef horizon was not exposed in either winze or station.

Dominion Reefs' June Quarterly

A profit of £186,361 (£185,965) was made by Dominion Reefs (Klerksdorp) during the three months ended June 30, 1956. A further instalment of £74,601 (same) was repaid in respect of uranium project loans of which amount £56,137 was capital and £18,464 interest. The latter amount was charged against profits.

Maiden Dividend Forecast by E.R.C.

Profits earned by East Rand Consolidated during the first six months of the year ending December 31, 1956, were running at a rate "somewhat in excess" of those in respect of the previous year said Mr. C. J. Burns, the chairman, at the company's recent meeting. Mr. Burns also forecast the possibility of recommending the payment of a maiden dividend for 1956. On July 31, the company's quoted investments—which had a book cost of £530,000—were valued on the market at £559,000.

Loan of £175,000 for Geita.—Agreement in principal has been reached between New Consolidated Goldfields and Kentan Gold Areas to provide Geita Gold Mining Company, of which Kentan owns 79 per cent, with loan facilities up to £175,000 at 6 per cent per annum in equal proportions between the two parties. The arrangements provide that Geita will grant an option to Gold Fields to subscribe up to December 31, 1959, for shares at par to the extent of £125,000.

A report covering operations at Geita during the June quarter reveals a working loss of £2,225, compared with a profit of £5,678 during the previous three months. This, it is understood, was due to technical difficulties which are receiving urgent attention. Development during the quarter on the North-East Extension disclosed some encouraging results. On Level 3, values of 4.8 dwt. per ton over 29.6 ft. were obtained, while work on Level 4 gave 5.9 dwt. over 20 ft. Total overall footage on strike at the mine amounted to 725 ft. with a value of 5.4 dwt. over 25 ft.

GEOLOGICAL SURVEY AND MUSEUM, LONDON: The Civil Service Commissioners invite applications for a pensionable post under the Department of Scientific and industrial research as Geologist or Senior Geologist according to age and qualifications. The work is connected with geophysical surveys in the field.

Candidates must have, or obtain in summer of 1956, a first or second class honours degree in Geology, or Geophysics, or Physics or Mathematics with at least first year standard both in Geology and in Physics or Mathematics or equivalent qualification, or have other suitable qualifications. Experience in Applied Geophysics an advantage. For appointments as Senior Geologist candidates must have at least three years' post-graduate or other approved experience.

For Senior Geologist candidates must be at least 26 on July 1, 1956. For Geologists at least 21 and under 30 years (under 31 for established members of the Experimental Officer class) on July 1, 1956, with extension for regular Forces Service. Salary scales: Men £605-£1,055 or £1,135-£1,345; Women £605-£962 or £1,026-£1,240 according to grading. Women's pay being improved under equal pay scheme. Provision for starting pay above minimum. Promotion prospects.

Further particulars and application forms from the Civil Service Commission, Scientific Branch, 30 Old Burlington Street, London, W.1, quoting No. S 4612/56/12. Application forms should be returned by August 31, 1956.

METALLURGICAL ENGINEER required for flotation research in copper cobalt concentrator in Uganda, British East Africa. Young graduate with about five years' experience in flotation of base metals both in laboratory and plant preferred. Apply with fullest details as to education, experience, references, marital status, etc., to General Manager, Kilembe Mines Limited, P.O. Kilembe, Uganda, British East Africa.

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FERRO-TITANIUM

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Please send replies to Companhia de Aproveitamento e Recuperacao Minero Electro-Quimica e Metalurgia, S.A.R.L., Palacio Atlantico, 4o Praca D. Joao I, Porto., Portugal.

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CONTINUED EXPANSION OF BUSINESS

The 143rd Ordinary Meeting (being the Annual General Meeting for the year 1956) was held on July 25 in London, **Sir Frederick Leith-Ross, G.C.M.G., K.C.B.** (the Chairman), presiding.

The following is an extract from his circulated statement :—

Once again I am able to report to you that the business of the Bank has continued to expand. This will be seen from the year's accounts, which show a Balance Sheet total of £18 million more than last year.

The year 1955 was, generally speaking, a year of great prosperity and active development in all our Territories. But it was marked by an increasing tightness of money and demands for extended credit, with a corresponding increase in the calls on our Bank for assistance. In an endeavour to meet the legitimate day to day claims in respect of the productive needs of industry and commerce without disturbing the even flow of the business of our customers, and at the same time to do our best to comply with official policy, we have had to adopt a process of careful selection to ensure that the assistance we could give was evenly spread between the great body of our customers.

During 1955 the issue of 2,000,000 fully paid £1 shares at 35s. per share was successfully accomplished, increasing the paid-up capital of the Bank by £2 million to a total of £9 million and providing a further £1,500,000, by way of share premium, as an addition to the Reserve Fund. The additional cash thus brought into our business has been of great assistance in meeting the pressure for accommodation with which we have been faced.

The Profit for the year is £823,359, an increase of about £35,000 on that of the previous year. The balance brought forward from the last year's accounts was £581,703 so we have £1,405,062 to deal with.

After various appropriations and the dividend distribution of 2s. 6d. per share there will remain £458,187 to be carried forward to the next accounts.

STANDARD BANK FINANCE AND DEVELOPMENT

After making a transfer to Reserve for Contingencies, the profit amounted to £21,178 which compares with £21,087 last year. Together with £64,292 the balance of Profit brought forward from last year there is £85,470 available for allocation. The Board of Directors have decided to repeat the modest distribution of 2s. 6d. per share paid last year which, after deduction of Income Tax at 8s. 6d. in the £, will take £14,375 and leave £71,095 to be carried forward to the next accounts.

BANKING COMPETITION

In all the countries in Africa where we operate we have seen in the last few years signs of increasing competition. In the Union considerations quite unrelated to the service provided by the Bank have often been brought to bear in order to secure the transfer from us of accounts which we have held for many years. Intense competition for deposits by Building Societies and other non-banking institutions has resulted in an increase in deposit rates in which the Banks have had to follow to some extent in protection of their positions.

Despite this increasing competition we have been able to maintain our position and, with the rapid development which is taking place throughout the Continent of Africa, I feel confident that the business of our Bank will continue to expand.

Union of South Africa : In South Africa 1955 was a good year for farmers and a record year in mining, manufacturing, building, the distributive trade and transportation, but it may mark the limit of the forward surge in the economy during the past three years. While 1956 may not be as commercially active and prosperous as the past few years, the difference is not likely to be great and the general level of trade may well be maintained.

The Federation of Rhodesia and Nyasaland : The past year was again one of great prosperity for the Federation. Development in all branches of industry continues actively.

There are few countries in the world which can offer such rich prospects for development as the Federation but, in present conditions of monetary stringency, the finance may not be readily available.

East Africa : In each of the East African territories experiments are at present being tried with a view to giving all races a limited share in the responsibilities of Government.

The report and accounts were adopted.

CONSOLIDATED TIN SMELTERS

SATISFACTORY AND PROFITABLE OPERATIONS

The annual general meeting of Consolidated Tin Smelters, Ltd., will be held on August 23 in London.

The following are extracts from the circulated statement by the chairman, **Mr. Clifford Waite :—**

It is my pleasure again to record satisfactory and profitable operations during the year ended March 31, 1956.

World production of tin in concentrates for the calendar year 1955 as published by the International Tin Study Group was 168,600 tons, practically the same figure as for the preceding year.

Malayan production during 1955 at 61,245 tons surpassed the previous year's total and was the highest production for any year since 1941. Thailand showed a steady increase in her production and it is expected that there will be a further increase during 1956. Indonesia, although maintaining her position as the second-largest producer showed a decline of 2,500 tons on the year 1954.

Bolivian production fell by about 1,000 tons, her production for the year 1955 amounting to 27,921 tons. Nigeria and Australia, which are also of interest to us through the supplies received by two of our subsidiary companies, recorded little change in their production. The remaining large producer—Belgian Congo—showed a slight increase.

The International Tin Study Group shows that world consumption of tin for 1955 was 148,400 tons, a significant increase of 9,800 tons on the year 1954.

PRODUCTION SURPLUS

Tin in concentrates produced exceeded the consumption of tin by 20,200 tons as shown by the above figures. During the year 1955 imports of tin in concentrates into the U.S.A. for the Texas City Smelter amounted to 20,097 tons all of which was "insulated". Whether this "insulated" tin went into stockpile can only be assumed; we do know that it was kept off the market.

It is extremely difficult to make a long-term forecast with any degree of accuracy under conditions ruling to-day. Consumption (excluding U.S.S.R. and China) for the years 1952 and 1953 was practically the same, while in 1954 consumption increased by 7,500 tons and in the year 1955 by 9,800 tons which resulted in an increase over the two years of 17,300 tons.

There exists in the world a large potential demand in consuming countries particularly in Asia, but the actual demand for tin containers and other tin bearing materials must naturally depend upon the development of those countries and an increase in their standard of living.

BALANCE SHEET AND REVENUE ACCOUNT

The parent company's net revenue for the year is £341,987, compared with £362,302 for the preceding year. Your Directors have appropriated from the net revenue £100,000 to General Reserve bringing this figure to one million pounds. They have also provided £11,215 to write down the cost of the investment in subsidiary companies, which makes a corresponding reduction in the figure of goodwill in the Group Accounts. The Board recommend for your approval a dividend of 3s. 0d. per £1 Ordinary Stock, less tax, payable on August 25, 1956. This dividend together with the Preference dividend will absorb a total net amount of £223,062 and after bringing in an amount of £210,776 from last year, and taxation adjustments of £1,522, the balance carried forward to the next account is increased to £220,008.

It is pleasing to note that notwithstanding a slight fall in the aggregate tonnage of concentrates treated at the works of our subsidiary companies engaged in tin smelting and also notwithstanding increased costs with which we have been faced, particularly in connection with repairs and maintenance, and the many other items which we have had to absorb, the Group trading profits of £1,207,302 show some increase over last year. After providing for taxation and adjustments in connection with minority shareholders' profits the consolidated net profit for the year at £549,819 shows an increase of £60,238.

Following the policy of diversification your Directors decided in August 1955 to buy the undertaking (including site and works plant) of Geo. L. Scott and Co. Ltd. of Ellesmere Port, Cheshire, electrical steel stampers. Trading results of this company have so far been favourable.

During the year under review we also increased our holding in one of our subsidiary companies—Keeling and Walker, Ltd., of Stoke-on-Trent, manufacturers of tin oxide—our original holding in this company being purchased in 1946.

Your Directors are continuing to examine other proposals for the expansion of the activities of the Group.

GOLD & BASE METAL MINES OF NIGERIA

FUTURE OUTLOOK

The twenty-second annual general meeting of Gold and Base Metal Mines of Nigeria, Ltd., was held on July 30 at the Chartered Insurance Institute, London, E.C.

Mr. A. Hedley Williams, M.I.M.M., M.Inst.Pet., a Director of the Company, presided and said :—

The review of the Chairman, Maj. Gen. W. W. Richards, C.B., C.B.E, M.C., which accompanied the report and accounts for the year ended December 31, 1955, will have acquainted you, I hope, fully with the state of the company's affairs, particularly when read in conjunction with the reports of the General Managers and our consultants.

I wish to reiterate your directors' regret that, having regard to the financial position of the company, they cannot at this stage recommend the payment of a dividend. This state of affairs is aggravated by the present credit squeeze.

Having regard to the fact that tin production may be restricted to some extent during 1957 as a result of the incidence of the International Tin Agreement, and also to the contributions which we shall be called upon to make to the Buffer Stock, coupled with the running out of our sales of columbite to the American Government at premium prices, your Directors earlier this year reviewed their policy in the light of the effect of the above matter.

Various steps have already therefore, been taken, the effect of which has been considerably to reduce our costs of operations, whilst the work of the Planning Department under the guidance of our consultants, is now beginning to bear fruit in improved methods of mining.

Prospecting operations have been scaled down to the minimum necessary for mining lease renewals, whilst now the columbite development programme is complete the necessity for a separate administrative area at Liruei has ceased. Consequently both areas are now combined under one General Manager, Mr. D. Hinton, and our combined costs for the production of tin and columbite are now at a level whereby tin and columbite mining operations are profitable at present prices. We have been able to show the Nigerian Government that results of development work on the Liruei Lode do not indicate the possibility of profitable exploitation and, as a result, our considerable expenditure in this connection is now at an end. This has already been provided for in the accounts now under review and will thus not recur.

Approximately 50 tons of our columbite production for the calendar year not committed for sale to the American Government at premium prices are under contract for sale elsewhere at a price comparable to that of tin. This additional contract takes care of all columbite we can deliver within the calendar year.

Naturally, members will be concerned as to the potentialities for sale of columbite for 1957 and after. There is no doubt that for a period there may be difficulty in effecting sales, but if we are able to sell at a price comparable with that of tin, this should be profitable to the company. Some time may elapse before manufacturers develop sufficiently their consumption of columbite to absorb current production. There are indications that consumption is expanding from the United States of America, certain continental countries and elsewhere, particularly in the production of stainless steels, where the greatest expansion in the use of columbite is likely to occur.

There have been certain comments in the financial press concerning the fact that we have not in our accounts this year broken down the cost of production as between the two minerals, tin and columbite, as in previous years. The figures we have given in previous years have of necessity been to a certain extent arbitrary, but it was considered desirable to endeavour to produce such figures in view of the price differential on sale which operated between the two minerals at such time. I am sure Members will appreciate that secondary columbite, such as is mined by us, occurs in association with tin, and both minerals are recovered in the one operation in varying ratios. It is only in order to provide a shipping grade of columbite that certain further mineral dressing charges may be incurred, which are comparatively small in relation to the whole cost. Accordingly, we have this year given an all-in cost of production for the combined minerals, which we feel is far more representative and in fact is realistic and should enable shareholders to evaluate the company's profitability.

The report and accounts were adopted.

EX-LANDS NIGERIA

The forty-fourth annual general meeting of Ex-Lands Nigeria, Ltd., was held on July 30 at Chartered Insurance Institute, London, E.C.

Mr. W. J. C. Richards, a Director, presided.

The following is an extract from the statement of the Chairman, **Major General W. W. Richards, C.B., C.B.E., M.C.,** circulated with the Report and Accounts for the year ended December 31, 1955 :—

Six hundred tons of tin concentrates of an average assay of 74.83% were produced. This is equivalent to 450 tons metal.

The average price per ton metal at which it was sold was some £39 per ton higher at £762, thus the aggregate revenue at £341,214 shows an increase of £12,221, although the output was slightly less than the previous year.

Tin winning expenditure amounted to £162,474 which is equal to £271 per ton, an increase of £19 per ton.

The payment for taxation is £36,700, the bulk of which is payable to the Nigerian Government. The balance available for distribution after payment of tax and bringing in the credit balance of £40,707 brought forward from the previous year is £71,880.

In view of the likely restriction of output to conform with the International Tin Agreement and the contingent liability on the Company of having to contribute in Tin or Cash to the Buffer Pool, your Board have felt bound to strengthen the Company's cash resources and have accordingly decided with regret to reduce the dividend distribution in respect of the year to 15% less tax. The dividend will take £23,949 leaving £47,931 to be carried forward on Profit and Loss Account.

Tonnages in excess of the indicated tonnage were recovered from several mining leases, and some 25 tons was won from re-treatment of tailings. It will be noted that for an output of 600 tons, the ore reserves show a decrease of only 255 tons, and at December 31, 1955, stood at the figure of 4,835 tons contained in 11,740,120 cubic yards of an average value of 0.92 lbs. per cubic yard.

Production for the first five months of the current financial year was 238 tons. This compares with 264 tons for the same period last year.

The report and accounts were adopted.

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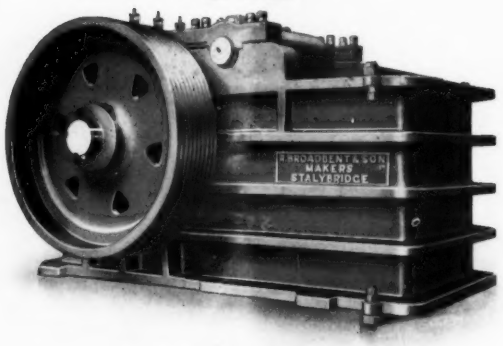

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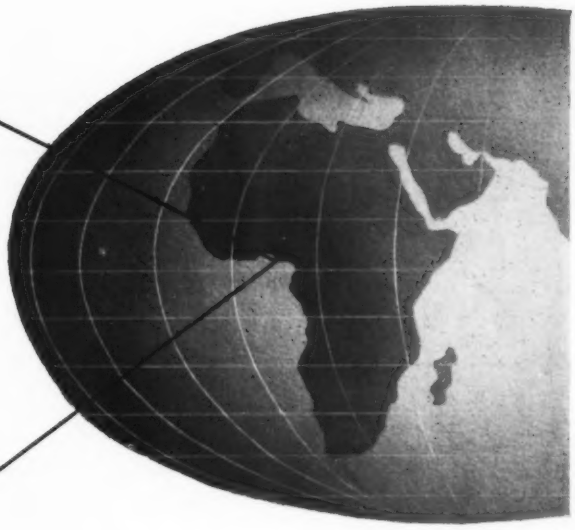

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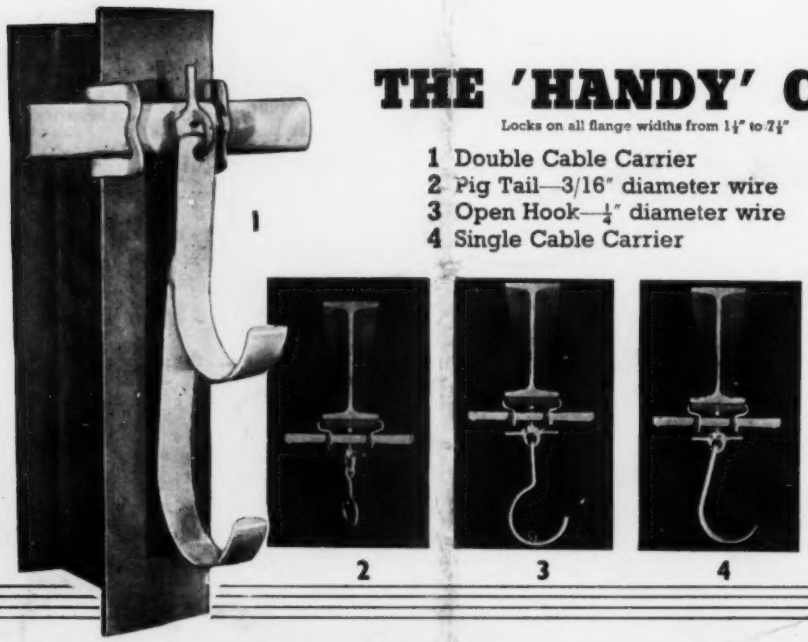

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